ORDER NO. MAC0112071C0

Service Manual

AIR CONDITIONER

CASSETTE TYPE

Indoor Model / Outdoor Model
(Cooling / Heat Pump)
CS-A24BB4P / (CU-C24BBP5 / CU-A24BBP5)
CS-A28BB4P / (CU-C28BBP5 / CU-A28BBP5)
CS-A28BB4P / (CU-C28BBP8 / CU-A28BBP8)
CS-A28BB4P / (CU-C28BBP6)
CS-A34BB4P / (CU-C34BBP5 / CU-A34BBP5)
CS-A34BB4P / (CU-C34BBP8 / CU-A34BBP8)
CS-A34BB4P / (CU-C34BBP7)
CS-A43BB4P / (CU-C43BBP8 / CU-A43BBP8)
CS-A43BB4P / (CU-C43BBP7)
CS-A50BB4P / (CU-C50BBP8 / CU-A50BBP8)
CS-A50BB4P / (CU-C50BBP7)

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⚠ **WARNING**
This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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⚠ **PRECAUTION OF LOW TEMPERATURE**

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

1. SERVICE INFORMATION

Notice of Address setting for NEW Cassette / NEW Outdoor Unit.

The new Cassette / new Outdoor models are possible to have address setting for twin / triple control or group control automatically when main power supply is switched on.
(Manual address setting is also possible by using DSW1 switch on the indoor unit P.C. board.)
However, this address setting is only possible when proper wiring connection is made and indoor unit must be of original unit.

1.1. Example of trouble during test operation

If the below phenomenon is found during test operation, wrong address setting is possible. / Therefore, please inspect the address setting.

1. **LCD display of the wired remote control is not illuminated although the main power supply switch is ‘on’.**
2. **LCD display had indicated as normal illumination when power supply switch is ‘on’, however outdoor unit cannot be operated. / (But, it is necessary to take 3 to 5 minutes for outdoor unit to start from the timing of remote control OFF/ON button is ‘on’.) / (For normal operation, the outdoor unit will only start its operation after 3 to 5 minutes upon pressing the OFF/ON button.)**
3. **P.C. board had memorized wrong setting information.**
   A. If main power supply is switched on with the wrong connection.
   B. When changing the connection or combination of units due to re-installation etc.

   - **When changing the system from twin to triple (triple to twin).**
   - **When changing the system from group control to normal one to one system.**

- When making the replacement of units of master and slave etc.

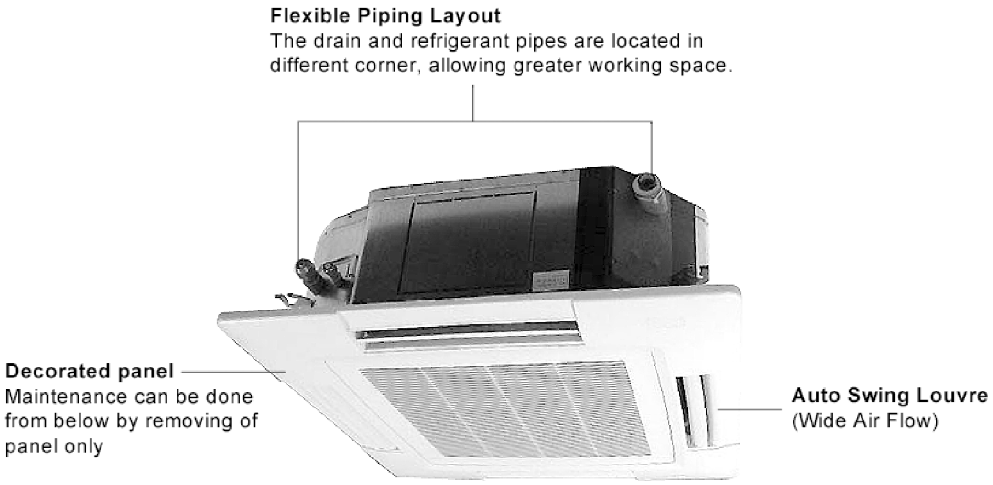
1.2. Caution during test operation

Do not touch the remote control button and do not change any wirings for one minute when the main power supply switch is ‘on’. / (Because the unit is having automatic address setting during the first one minute.)

1.3. Caution during automatic address setting

When the main power supply switch is ‘on’, the P.C. board will automatically memorize the connecting system. / Consequently, when initial power supply is ‘on’, there mustn’t be any interchanging of units even of the same type and same capacity unit. / Therefore, connection of the unit to another system is prohibited.

2. FEATURES



Flexible Piping Layout
The drain and refrigerant pipes are located in different corner, allowing greater working space.

Decorated panel
Maintenance can be done from below by removing of panel only

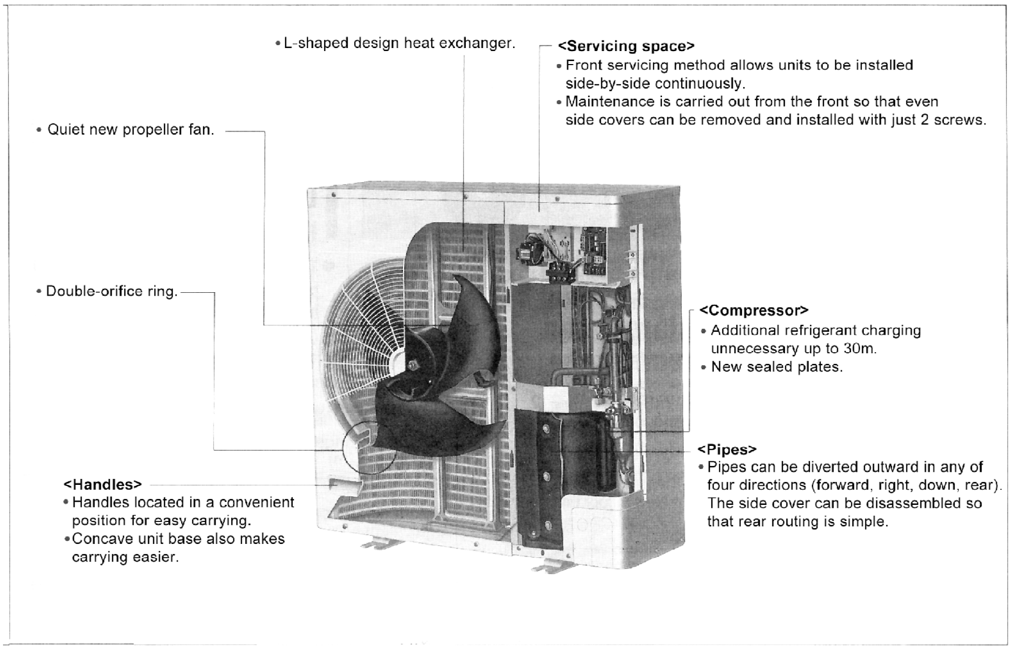
Auto Swing Louvre
(Wide Air Flow)

2.1. Variety of excellent features

- Compact design / Compact design 240 mm height, 840 mm width and 840 mm depth. (3 HP unit body)
- Automatic restart function / When the electric power resumes after a power failure, the unit will automatically restarts the operation in the pre-failure mode.
- Auto fan mode (indoor unit) / Auto fan mode is added besides HI, ME and LO. / It automatically adjusts the fan speed according to the indoor temperature.
- Dry mode function / Dry mode can make a comfortable indoor environment during wet season.
- Quiet operation / The sound level is 41dB (A) for 28BB model during High Fan speed and suitable for offices, shops, homes etc, when quiet operation is essential.

- Auto Swing Louvre / The air flow angle can be changed automatically (or manually) to an angle between 10° to 70° using the remote control.
- Low ambient cooling operation / Cooling operation is possible at outdoor temperature of / -5°C.
- Automatic changeover function (heat pump models) The unit automatically switches between cooling and heating in accordance with operating load in order to maintain a comfortable indoor temperature.
- Hot start system (heat pump models)
- Pipes and drainage / Built-in upward draining mechanism.

2.2. Low-noise outdoor units



• L-shaped design heat exchanger.

<Servicing space>
• Front servicing method allows units to be installed side-by-side continuously.
• Maintenance is carried out from the front so that even side covers can be removed and installed with just 2 screws.

• Quiet new propeller fan.

• Double-orifice ring.

<Compressor>
• Additional refrigerant charging unnecessary up to 30m.
• New sealed plates.

<Pipes>
• Pipes can be diverted outward in any of four directions (forward, right, down, rear). The side cover can be disassembled so that rear routing is simple.

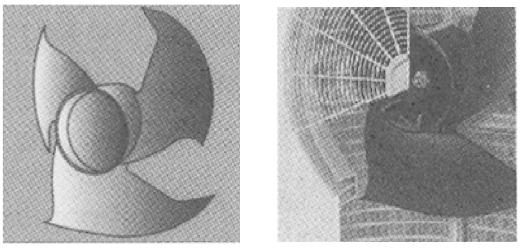
<Handles>
• Handles located in a convenient position for easy carrying.
• Concave unit base also makes carrying easier.

2.2.1. Product features

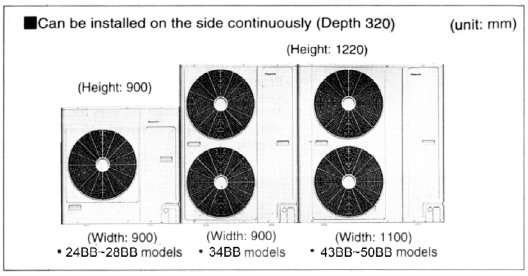
- Low-noise design improves comfort in surrounding areas

1. The noise-suppressing winglet fan is a result of new research into vane design theory. The unique curved shape suppresses the generation of vortexes, thus reducing air flow noise.
2. The adoption of double-orifice rings reduces air passage resistance.
3. Strengthening of the noise insulation materials in the compressor and the sealing-in of mechanical noise allows vibration noise to be greatly enclosed and suppressed.

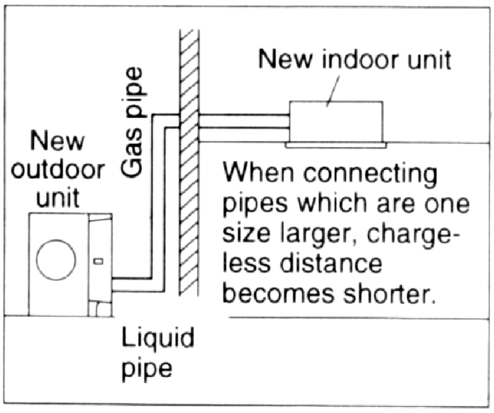
4. **The heat exchanger has an L-shaped design to allow air to flow more smoothly.**
5. **Noise is automatically reduced further during night-time operation with lower outdoor air temperatures.**



2.3. Greatly improved workability increases system renewal capability


■Can be installed on the side continuously (Depth 320)
(unit: mm)
(Height: 1220)
(Height: 900)
(Width: 900)
• 24BB~28BB models
(Width: 900)
• 34BB models
(Width: 1100)
• 43BB~50BB models

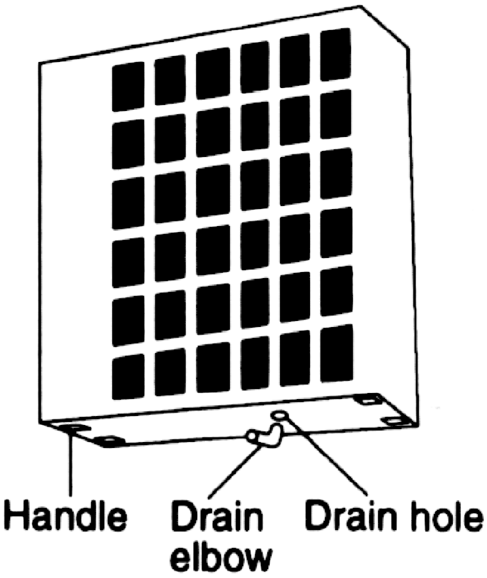
- **Pipes that are one size larger can also be connected for renewal.**
- **If renewing the system, existing refrigerant pipes can be utilized so that only the indoor and outdoor units need to be replaced.**
- **For example, liquid and gas pipes from 10 years ago can be connected to current pipes with the same size or one size larger. Effective utilization of materials reduces working time and trouble. (Adaptor sockets are not supplied.)**


New indoor unit
Gas pipe
New outdoor unit
When connecting pipes which are one size larger, charge-less distance becomes shorter.
Liquid pipe

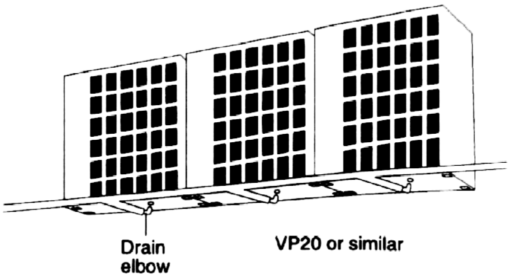
- **Additional refrigerant charging unnecessary for 30 m**
- **All models do not require any additional charging of refrigerant for**

30 m of pipe length. This makes installation much easier.

- **Drain water dripping-prevention structure**
- **The base of the outdoor unit is provided with a single drain hole in order to prevent drain water from leaking out of the unit. By connecting a drain elbow and a discharge pipe, water leakages can be prevented even when the unit is installed to a wall.**

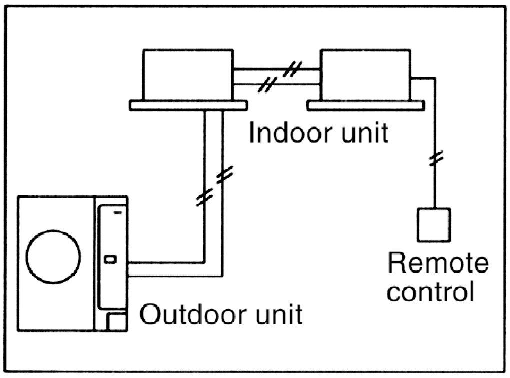


- **Save space design allows units to be installed side-by-side continuously**
- **Servicing after installation can be carried out by removing the front covers.**
- **Long pipe design for refrigerant pipes**
- **Maximum piping length of 50m for all models.**
- **Internal pipe connection**
- **Pipes are connected inside the units (inside the side covers), making the final appearance more attractive.**
- **Pipes can be diverted outward in any of four directions (forward, right, down, rear).**
- **Small liquid pipe diameters of 9.52mm for 43BB and 50BB models, making installation work much easier.**
- **Centralized draining method**
- **Even when multiple outdoor units are installed to a wall, the drain outlets can be concentrated into a single drain pipe. This makes installation easier and also improves appearance.**



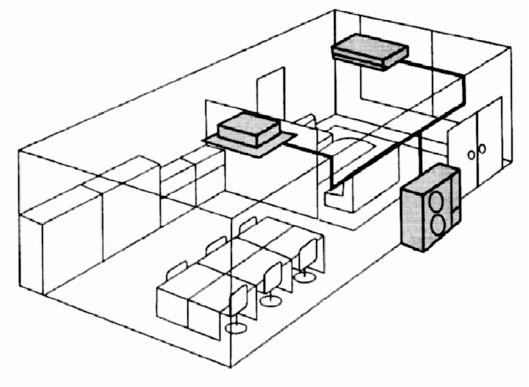
2.4. A brand-new control method using the latest in technology

- Easier power supply wiring connection / Power supply wiring and other wiring tasks can be carried out more easily.
- Twin non-polar wires used to connect indoor and outdoor units.
- Adoption of connection error prevention circuits for drive wires and signal wires. If a connection error is made, the relay does not operate and current does not flow to the circuit boards.

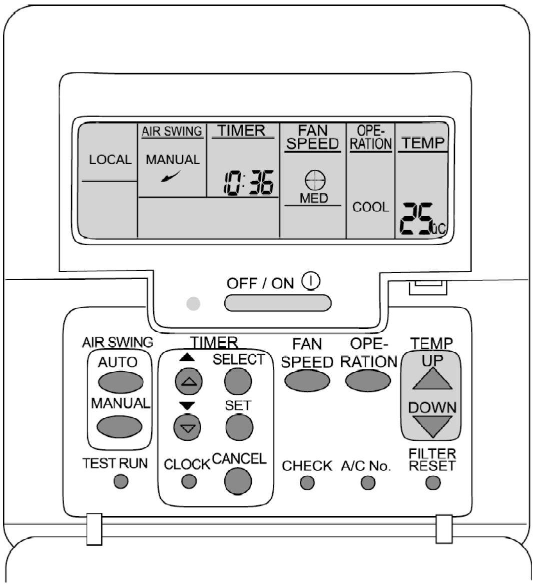


- Twin and Triple operation
- Simultaneous air conditioning of wide spaces and corners is possible. Indoor units of different horsepowers can even be used in combination.
- Master unit and slave-units can be set automatically in twin and triple systems. No address setting is necessary.
- Multiple indoor units can be operated simultaneously with a single remote control. Note that individual operation is not possible.
- Separate indoor/outdoor unit power supplies / The power supply can be connected to (1) just the outdoor units, or (2) to both the indoor and outdoor units.
- Easy test operation / Test operation can be carried out for both indoor and outdoor units.
- Automatic setting initialization function (Remote control and Indoor unit) / In accordance with the indoor and outdoor units

connected and the connection methods, conditions such as the connection configuration (twin or triple format) and remote-control functions such as automatic louvre operation and cooling or heating mode are automatically detected and set instantly.

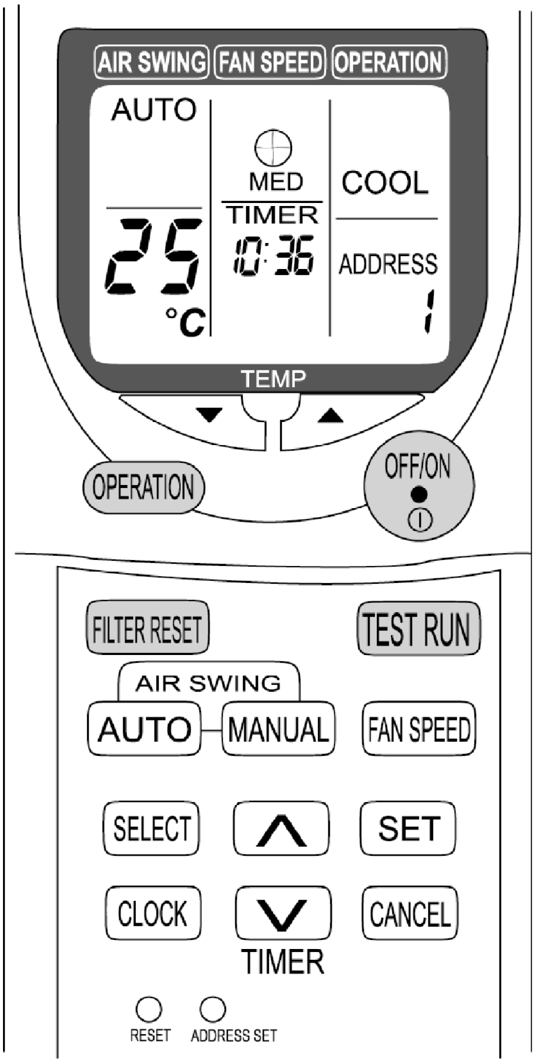


2.5. Wired Remote Control


AIR SWING
TIMER
FAN SPEED
OPE-RATION
TEMP
LOCAL
MANUAL
0:36
MED
COOL
25°C
OFF / ON
AIR SWING
AUTO
MANUAL
TIMER
SELECT
SET
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET

- The new design includes an easily-visible red pilot lamp. The power can be turned on and off at a single touch, without opening the cover.
- Has a built-in thermistor, allowing indoor temperature detection in accordance with indoor conditions by switching with main unit thermistor.
- Twin non-polar wires make installation work easy. (10 m cable supplied as accessory.)

2.6. Wireless Remote Control

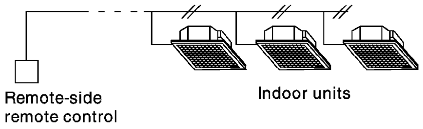
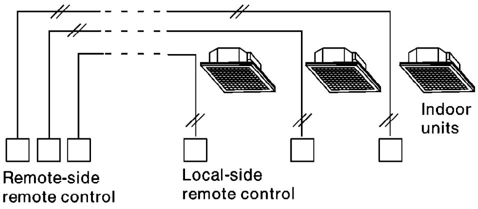
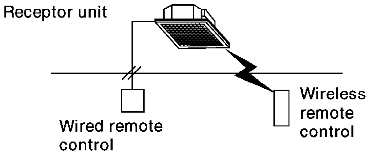

AIR SWING
FAN SPEED
OPERATION
AUTO
MED
COOL
TIMER
25
10:36
ADDRESS
°C
1
TEMP
OPERATION
OFF/ON
FILTER RESET
TEST RUN
AIR SWING
AUTO
MANUAL
FAN SPEED
SELECT
SET
CLOCK
CANCEL
TIMER
RESET
ADDRESS SET

- **New design with compact size. (Operation range within approximately 8 m.)**
- **Built-in timer with ON/OFF timer setting (within 24 hours)**

	Wired	**Wireless**
Heat Pump	**CZ-RD51P**	**CZ-RL51P**
Cooling	**CZ-RD51P**	**CZ-RL01P**

NOTE: Both of the above remote control is packed separately from the indoor unit.

2.7. Group Control Equipment

Wired remote control	**Group control by one remote control** ● All air conditioner units are controlled as a whole by remote control. ● All indoor units operate in the same mode ● A maximum of 16 units can be connected together (sequential starting)		**[Remote side]** ● Optional wired remote control CZ-RD51P **[Local side]** Not needed
	Twin remote control separate control ● Each indoor unit can be operated by either one of the two remote controls. ● Apart from timer setting time, displays for two remote control are identical. ● Last button pressed has priority (main or slave is set at remote control unit.)	 Indoor units Remote-side remote control Local-side remote control	**[Remote side]** ● Optional wired remote control **[Local side]** ● Optional wired remote control CZ-RD51P
Common control	**Common control/group** ● Operation is possible using either wired or wireless remote control unit. ● Last button pressed has priority.	 Receptor unit Wired remote control Wireless remote control	● Optional wired remote control and wireless remote control Wired CZ-RD51P Wireless CZ-RL01P (Cooling) CZ-RL51P (Heat pump)

3. SPECIFICATION (HEAT PUMP TYPE)

3.1. CS-A24BB4P / CU-A24BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A24BB4P			CU-A24BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	6.3			
			BTU/h	21,500			
Heating Capacity			kW	7.1			
			BTU/h	24,200			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 17	Me 15	Lo 14	Hi 43
			cfm	600	530	494	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/1 6 x 35-7/16
Net Weight			kg	26			81
			lbs	57			179
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 6.35 (1/4) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x

Compressor	**Type, Number of Set**			**-**			**Hermetic-1 (Ro**
	Starting Method			**-**			**Direct on-line s**
	Motor	**Type**		**-**			**2-pole single p induction m**
		Input	**kW**	**-**			**Cool/Heat 2.3**
		Rated Output	**kW**	**-**			**1.9**
Fan	**Type, Number of Set**			**Turbo fan-1**			**Propeller fa**
	Motor	**Type**		**6-pole single phase induction motor**			**6-pole single p induction m**
		Input	**kW**	**0.08**			**0.11**
		Rated Output	**kW**	**0.03**			**0.05**
Air-heat Exchanger				**Slit-fin type**			**Louvre-fin t**
Refrigerant Control			**Cool**	**Capillary tube**			**-**
			Heat	**-**			**Capillary tu**
Refrigerant Oil (Charged)			**litre**	**-**			**MS32 (1.3**
Refrigerant (Charged)			**kg**	**-**			**(2.5)**
			lbs				**(5.5)**
Running Adjustment	**Control Switch**			**Wireless or Wired Remote Control**			**-**
	Room Temperature			**Thermostat (Main Body)**			**-**
Safety Devices				**Internal protector for compressor, Internal therm fan motor, Crankcase heater, High and heating switch, Current transformer**			
Noise Level		**Cool**	**dB (A)**	**Hi 42**	**Me 40**	**Lo 38**	**Hi 50**
		Heat		**Hi 42**	**Me 40**	**Lo 38**	**Hi 51**

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)**

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A24BB4P, CU-A24BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Sing
Power Consumption	kW	Cool	2.50	2.50	2.5
		Heat	2.49	2.49	2.4
Running Current	A	Cool	11.5	11.1	10.
		Heat	11.4	11.0	10.
Starting Current	A		49	51	52
Power Factor	%	Cool	99	98	97
		Heat	99	98	97
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 1~220V, 230V, 240V 50H	

3.2. CS-A28BB4P / CU-A28BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A28BB4P			CU-A28BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	7.1			
			BTU/h	24,200			
Heating Capacity			kW	8.0			
			BTU/h	27,300			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 20	Me 18	Lo 16	Hi 43
			cfm	706	635	565	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/16 x 35-7/16
Net Weight			kg	26			82
			lbs	57			181
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool/Heat 2.4
		Rated Output	kW	-			2.0

Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.09			0.11
		Rated Output	kW	0.04			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary tu
Refrigerant Oil (Charged)			litre	-			MS32 (1.
Refrigerant (Charged)			kg	-			(3.8)
			lbs				(8.4)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High and heating switch, Current transformer			
Noise Level		Cool	dB (A)	Hi 44	Me 42	Lo 40	Hi 50
		Heat		Hi 44	Me 42	Lo 40	Hi 53

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A28BB4P, CU-A28BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Sing
Power Consumption	kW	Cool	2.69	2.69	2.6
		Heat	2.61	2.61	2.61
Running Current	A	Cool	12.3	12.0	11.
		Heat	12.0	11.7	11.
Starting Current	A		50	52	54
Power Factor	%	Cool	99	98	96
		Heat	99	97	95
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 1~220V, 230V, 240V 50H		

3.3. CS-A28BB4P / CU-A28BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A28BB4P			CU-A28BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	7.1			
			BTU/h	24,200			
Heating Capacity			kW	8.0			
			BTU/h	27,300			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 20	Me 18	Lo 16	Hi 43
			cfm	706	635	565	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/1 6 x 35-7/16
Net Weight			kg	26			82
			lbs	57			181
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line s
	Motor	Type		-			2-pole 3-phase ir motor
		Input	kW	-			Cool/Heat 2.4
		Rated Output	kW	-			2.0
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.09			0.11
		Rated Output	kW	0.04			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary tu
Refrigerant Oil (Charged)			litre	-			MS32 (1.
Refrigerant (Charged)			kg	-			(3.8)
			lbs				(8.4)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Heat thermostat for compressor, Internal therm fan motor, Crankcase heater, High and heating switch, Current transformer			

Noise Level	Cool	dB (A)	Hi 39	Me 37	Lo 35	Hi 50
	Heat		Hi 39	Me 37	Lo 35	Hi 53

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A28BB4P, CU-A28BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	2.69	2.69	2.69
		Heat	2.61	2.61	2.61
Running Current	A	Cool	4.50	4.45	4.4
		Heat	4.30	4.25	4.2
Starting Current	A		28	29	30
Power Factor	%	Cool	93	89	87
		Heat	92	89	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 451V 50		

3.4. CS-A34BB4P / CU-A34BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A34BB4P			CU-A34BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	10.0			
			BTU/h	34,100			
Heating Capacity			kW	11.2			
			BTU/h	38,200			
Refrigerant Charge-less			m	30			
Standard Air Volume for High,			m^3/min	Hi 26	Me 23	Lo 20	Hi 70
Medium and Low Speed			cfm	918	812	706	2471
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 900 x
			inch	11-7/16 x 33-1/24 x 33-1/24			48-7/24 x 35-7/16
Net Weight			kg	30			97
			lbs	66			214
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool/Heat 3.2
		Rated Output	kW	-			2.8
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.15			0.24
		Rated Output	kW	0.08			0.055 x 2
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary tu
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(4.2)
			lbs				(9.3)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therm fan motor, Crankcase heater, High and heating switch, Current transformer			
Noise Level		Cool	dB (A)	Hi 45	Me 42	Lo 40	Hi 55
		Heat		Hi 45	Me 42	Lo 40	Hi 56

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)**

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A34BB4P, CU-A34BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Sing
Power Consumption	kW	Cool	3.60	3.60	3.60
		Heat	3.55	3.55	3.55
Running Current	A	Cool	17.0	17.1	17.2
		Heat	16.8	16.9	17.0
Starting Current	A		94	99	103
Power Factor	%	Cool	96	92	87
		Heat	96	91	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 1~220V, 230V, 240V 50H	

3.5. CS-A34BB4P / CU-A34BBP8

ITEM / MODEL		Indoor Unit			Outdoor u
	Main Body	CS-A34BB4P			CU-A34BB
	Panel	CZ-BT01P			
	Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity	kW	10.0			
	BTU/h	34,100			
Heating Capacity	kW	11			
	BTU/h	38,200			
Refrigerant Charge-less	m	30			
Standard Air Volume for High, Medium and Low Speed	m3/min	Hi 26	Me 23	Lo 20	Hi 70
	cfm	918	812	706	2471
Outside Dimension (H x W x D)	mm	290 x 840 x 840			1220 x 900 x
	inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 35-7/16
Net Weight	kg	30			97
	lbs	66			214

Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase i motor
		Input	kW	-			Cool/Heat 2.9
		Rated Output	kW	-			2.8
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.15			0.24
		Rated Output	kW	0.08			0.055 x
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary t
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(4.2)
			lbs				(9.3)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therm fan motor, Crankcase heater, High and heating switch, Current transformer			
Noise Level		Cool	dB (A)	Hi 45	Me 42	Lo 40	Hi 55
		Heat		Hi 45	Me 42	Lo 40	Hi 56

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A34BB4P, CU-A34BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	3.30	3.30	3.3
		Heat	3.40	3.40	3.4
Running Current	A	Cool	5.70	5.70	5.7
		Heat	5.80	5.80	5.8
Starting Current	A		39	41	42
Power Factor	%	Cool	88	84	81
		Heat	89	85	82
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 3N~380V, 400V, 415V 50	

3.6. CS-A43BB4P / CU-A43BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A43BB4P			CU-A43BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	12.5			
			BTU/h	42,700			
Heating Capacity			kW	14.0			
			BTU/h	47,800			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 30	Me 27	Lo 24	Hi 82
			cfm	1059	953	847	2895
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100
			inch	11-7/16 x 33-1/24 x 33-1/24			48-7/24 x 35-7/16
Net Weight			kg	33			114
			lbs	73			251
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase i motor
		Input	kW	-			Cool/Heat 3.8
		Rated Output	kW	-			3.5

Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.17			0.23
		Rated Output	kW	0.12			0.050 x
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary tu
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(5.2)
			lbs				(11.5)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal thern fan motor, Crankcase heater, High and heating switch, Current transformer			
Noise Level		Cool	dB (A)	Hi 48	Me 46	Lo 44	Hi 55
		Heat		Hi 48	Me 46	Lo 44	Hi 56

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A43BB4P, CU-A43BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	4.25	4.25	4.2
		Heat	4.10	4.10	4.1
Running Current	A	Cool	7.3	7.3	7.3
		Heat	7.0	7.0	7.0
Starting Current	A		58	58	58
Power Factor	%	Cool	88	84	81
		Heat	89	85	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 3N~380V, 400V, 415V 50	

3.7. CS-A50BB4P / CU-A50BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A50BB4P			CU-A50BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL51P (Wireless)			
Cooling Capacity			kW	14.0			
			BTU/h	47,800			
Heating Capacity			kW	15.5			
			BTU/h	52,900			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 30	Me 27	Lo 24	Hi 86
			cfm	1059	953	847	3036
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100 x
			inch	11-7/16 x 33-1/24 x 33-1/24			48-7/24 x 43-5/16 x
Net Weight			kg	33			116
			lbs	73			256
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line s
	Motor	Type		-			2-pole 3-phase ir motor
		Input	kW	-			Cool/Heat 4.5
		Rated Output	kW	-			4.1
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.18			0.25
		Rated Output	kW	0.14			0.055 x 2
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control			Cool	Capillary tube			-
			Heat	-			Capillary tu
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(5.0)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therm fan motor, Crankcase heater, High and heating switch, Current transformer			

Noise Level	Cool	dB (A)	Hi 50	Me 47	Lo 45	Hi 56
	Heat		Hi 50	Me 47	Lo 45	Hi 58

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**
2. **Heating capacities are based on indoor temperature of 20°C D.B. (68°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)**

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A50BB4P, CU-A50BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	4.99	4.99	4.9
		Heat	4.97	4.97	4.9
Running Current	A	Cool	8.6	8.6	8.6
		Heat	8.5	8.5	8.5
Starting Current	A		69	69	69
Power Factor	%	Cool	88	84	81
		Heat	89	84	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source		AC, 3N~380V, 400V, 415V 50		

4. SPECIFICATION (COOLING ONLY TYPE)

4.1. CS-A24BB4P / CU-C24BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A24BB4P			CU-C24BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	6.3			
			BTU/h	21,500			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 17	Me 15	Lo 14	Hi 43
			cfm	600	530	494	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/16 x 35-7/16 x
Net Weight			kg	26			80
			lbs	57			176
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 6.35 (1/4) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line s
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool 2.3
		Rated Output	kW	-			1.9
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		4-pole single phase induction motor			6-pole single induction m
		Input	kW	0.08			0.11
		Rated Output	kW	0.03			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			MS32 (1.3
Refrigerant (Charged)			kg	-			(2.5)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therm fan motor, Crankcase heater, High pressure s Current transformer			
Noise Level			dB	Hi 42	Me 40	Lo 38	Hi 50

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air**

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A24BB4P, CU-C24BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	240
Phase			Single	Single	Sing
Power Consumption	kW	Cool	2.50	2.50	2.5
Running Current	A	Cool	11.5	11.1	10.7
Starting Current	A		49	51	52
Power Factor	%	Cool	99	98	97
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 1~220V, 230V, 240V 50H	

4.2. CS-A28BB4P / CU-C28BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A28BB4P			CU-C28BE
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	7.1			
			BTU/h	24,200			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 20	Me 18	Lo 16	Hi 43
			cfm	706	635	565	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/16 x 35-7/16
Net Weight			kg	26			81
			lbs	57			179
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool 2.4
		Rated Output	kW	-			2.0

Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.09			0.11
		Rated Output	kW	0.04			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			MS32 (1.
Refrigerant (Charged)			kg	-			(3.8)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB	Hi 44	Me 42	Lo 40	Hi 50

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)**

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A28BB4P, CU-C28BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	24
Phase			Single	Single	Sing
Power Consumption	kW	Cool	2.69	2.69	2.6
Running Current	A	Cool	12.3	12.0	11.
Starting Current	A		50	52	54
Power Factor	%	Cool	99	98	96
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 1~220V, 230V, 240V 50	

4.3. CS-A28BB4P / CU-C28BBP6

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A28BB4P			CU-C28BE
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	7.6			
			BTU/h	25,900			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 20	Me 18	Lo 16	Hi 43
			cfm	706	635	565	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/16 x 35-7/16
Net Weight			kg	26			81
			lbs	57			179
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Ro
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool 3.0
		Rated Output	kW	-			2.0
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.09			0.11
		Rated Output	kW	0.04			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			MS32 (1.
Refrigerant (Charged)			kg	-			(3.8)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB	Hi 44	Me 42	Lo 40	Hi 53

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air**

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (60Hz)

ITEM / MODEL			CS-A28BB4P, CU-C28BBP6
			Condition by JIS B 8615
Volts	V		220
Phase			Single
Power Consumption	kW	Cool	3.20
Running Current	A	Cool	15.3
Starting Current	A		70
Power Factor	%	Cool	95
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.			
Panasonic	Power source		AC, 1~220V, 60Hz

4.4. CS-A28BB4P / CU-C28BBP8

ITEM / MODEL				Indoor Unit			Outdoor
			Main Body	CS-A28BB4P			CU-C28B
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	7.1			
			BTU/h	24,200			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 20	Me 18	Lo 16	Hi 43
			cfm	706	635	565	1518
Outside Dimension (H x W x D)			mm	240 x 840 x 840			900 x 900 x
			inch	9-7/16 x 33-1/24 x 33-1/24			35-7/16 x 35-7/16
Net Weight			kg	26			81
			lbs	57			179
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 15.88 (5/8) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20
Compressor	Type, Number of Set			-			Hermetic-1 (R
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase motor
		Input	kW	-			Cool 2.4
		Rated Output	kW	-			2.0

Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.09			0.11
		Rated Output	kW	0.04			0.05
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			MS32 (1.
Refrigerant (Charged)			kg	-			(3.8)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Head thermostat for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB (A)	Hi 39	Me 37	Lo 35	Hi 50

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A28BB4P, CU-C28BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	41
Phase			3N	3N	3N
Power Consumption	kW	Cool	2.69	2.69	2.6
Running Current	A	Cool	4.50	4.45	4.4
Starting Current	A		28	29	30
Power Factor	%	Cool	93	89	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 3N~380V, 400V, 415V 50	

4.5. CS-A34BB4P / CU-C34BBP5

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A34BB4P			CU-C34BE
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	10.0			
			BTU/h	34,100			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 26	Me 23	Lo 20	Hi 70
			cfm	918	812	706	2471
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 900 x
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 35-7/16
Net Weight			kg	30			97
			lbs	66			214
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (S
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole single induction m
		Input	kW	-			Cool 3.2
		Rated Output	kW	-			2.8
Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.15			0.24
		Rated Output	kW	0.08			0.055 x
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(4.2)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therr fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB (A)	Hi 45	Me 42	Lo 40	Hi 55

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air**

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A34BB4P, CU-C34BBP5		
			Condition by JIS B 8615		
Volts	V		220	230	24
Phase			Single	Single	Sing
Power Consumption	kW	Cool	3.60	3.60	3.6
Running Current	A	Cool	17.00	17.10	17.2
Starting Current	A		94	99	10
Power Factor	%	Cool	96	92	87
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 1~220V, 230V, 240V 50	

4.6. CS-A34BB4P / CU-C34BBP7

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A34BB4P			CU-C34B
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	10.0			
			BTU/h	34,100			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 26	Me 23	Lo 20	Hi 70
			cfm	918	812	706	2471
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 900
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 35-7/16
Net Weight			kg	30			95
			lbs	66			209
Piping Connection	**Refrigerant**	**Gas**	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20
Compressor	**Type, Number of Set**			-			Hermetic-1 (S
	Starting Method			-			Direct on-line
	Motor	**Type**		-			2-pole 3-phase motor
		Input	kW	-			Cool 3.7
		Rated Output	kW	-			2.8

Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.15			0.24
		Rated Output	kW	0.08			0.055 x
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(4.2)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB (A)	Hi 45	Me 42	Lo 40	Hi 55

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (60Hz)

ITEM / MODEL			CS-A34BB4P, CU-C34BBP7
			Condition by JIS B 8615
Volts	V		220
Phase			3
Power Consumption	kW	Cool	3.30
Running Current	A	Cool	5.70
Starting Current	A		39
Power Factor	%	Cool	88
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.			
Panasonic	Power source		AC, 3~220V, 60Hz

4.7. CS-A34BB4P / CU-C34BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A34BB4P			CU-C34BE
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	10.0			
			BTU/h	34,100			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 26	Me 23	Lo 20	Hi 70
			cfm	918	812	706	2471
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 900
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 35-7/16
Net Weight			kg	30			95
			lbs	66			209
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20
Compressor	Type, Number of Set			-			Hermetic-1 (S
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase i motor
		Input	kW	-			Cool 2.9
		Rated Output	kW	-			2.8
Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.15			0.24
		Rated Output	kW	0.08			0.055 x
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(4.2)
			lbs				(11.1)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB (A)	Hi 45	Me 42	Lo 40	Hi 55

1. **Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.), and outdoor air**

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A34BB4P, CU-C34BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	415
Phase			3N	3N	3N
Power Consumption	kW	Cool	3.30	3.30	3.3
Running Current	A	Cool	5.70	5.70	5.7
Starting Current	A		39	41	42
Power Factor	%	Cool	88	84	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 3N~380V, 400V, 415V 50	

4.8. CS-A43BB4P / CU-C43BBP7

ITEM / MODEL				Indoor Unit			Outdoor
			Main Body	CS-A43BB4P			CU-C43B
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	13.5			
			BTU/h	46,100			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 30	Me 27	Lo 24	Hi 80
			cfm	1059	953	847	2824
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 43-5/16
Net Weight			kg	33			111
			lbs	73			245
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20
Compressor	Type, Number of Set			-			Hermetic-1 (S
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase motor
		Input	kW	-			Cool 4.7
		Rated Output	kW	-			3.5

Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.17			0.23
		Rated Output	kW	0.12			0.050 x
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(5.2)
			lbs				(11.5)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB	Hi 49	Me 46	Lo 44	Hi 57

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (60Hz)

ITEM / MODEL			CS-A43BB4P, CU-C43BBP7
			Condition by JIS B 8615
Volts	V		220
Phase			3
Power Consumption	kW	Cool	5.10
Running Current	A	Cool	15.0
Starting Current	A		103
Power Factor	%	Cool	89
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.			
Panasonic	Power source		AC, 3~220V, 60Hz

4.9. CS-A43BB4P / CU-C43BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A43BB4P			CU-C43BE
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	12.5			
			BTU/h	42,700			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 30	Me 27	Lo 24	Hi 82
			cfm	1059	953	847	2895
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 43-5/16
Net Weight			kg	33			111
			lbs	73			245
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Sc
	Starting Method			-			Direct on-line s
	Motor	Type		-			2-pole 3-phase in motor
		Input	kW	-			Cool 3.8
		Rated Output	kW	-			3.5
Fan	Type, Number of Set			Turbo fan-1			Propeller fa
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.17			0.23
		Rated Output	kW	0.12			0.050 x
Air-heat Exchanger				Slit-fin type			Louvre-fin t
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(5.2)
			lbs				(11.5)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal therr fan motor, Crankcase heater, High pressure s Current transformer			
Noise Level			dB	Hi 48	Me 46	Lo 44	Hi 55

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

ITEM / MODEL			CS-A43BB4P, CU-C43BBP8		
			Condition by JIS B 8615		
Volts	V		380	400	41
Phase			3N	3N	3N
Power Consumption	kW	Cool	4.25	4.25	4.2
Running Current	A	Cool	7.30	7.30	7.3
Starting Current	A		58	58	58
Power Factor	%	Cool	88	84	81
*Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.					
Panasonic	Power source			AC, 3N~380V, 400V, 415V 50	

4.10. CS-A50BB4P / CU-C50BBP7

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A50BB4P			CU-C50BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	15.1			
			BTU/h	51,500			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m3/min	Hi 31	Me 26	Lo 22	Hi 86
			cfm	940	788	667	3036
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 43-5/16
Net Weight			kg	33			114
			lbs	73			251
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20
Compressor	Type, Number of Set			-			Hermetic-1 (Sc
	Starting Method			-			Direct on-line s
	Motor	Type		-			2-pole 3-phase i motor
		Input	kW	-			Cool 5.5
		Rated Output	kW	-			4.1

Fan	**Type, Number of Set**			**Turbo fan-1**			**Propeller fa**
	Motor	**Type**		**6-pole single phase induction motor**			**6-pole single p induction m**
		Input	**kW**	**0.25**			**0.25**
		Rated Output	**kW**	**0.095**			**0.055 x 2**
Air-heat Exchanger				**Slit-fin type**			**Louvre-fin t**
Refrigerant Control				**Capillary tube**			**-**
Refrigerant Oil (Charged)			**litre**	**-**			**SONTEX200L**
Refrigerant (Charged)			**kg**	**-**			**(5.0)**
			lbs				**(11.0)**
Running Adjustment	**Control Switch**			**Wireless or Wired Remote Control**			**-**
	Room Temperature			**Thermostat (Main Body)**			**-**
Safety Devices				**Internal protector for compressor, Internal therm fan motor, Crankcase heater, High pressure s Current transformer**			
Noise Level			**dB**	**Hi 49**	**Me 46**	**Lo 43**	**Hi 58**

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (60Hz)

ITEM / MODEL			**CS-A50BB4P, CU-C50BBP7**
			Condition by JIS B 8615
Volts	**V**		**220**
Phase			**3**
Power Consumption	**kW**	**Cool**	**6.0**
Running Current	**A**	**Cool**	**17.7**
Starting Current	**A**		**149**
Power Factor	**%**	**Cool**	**89**
***Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.**			
Panasonic	**Power source**		**AC, 3~220V 60Hz**

4.11. CS-A50BB4P / CU-C50BBP8

ITEM / MODEL				Indoor Unit			Outdoor u
			Main Body	CS-A50BB4P			CU-C50BB
			Panel	CZ-BT01P			
			Remote Control	CZ-RD51P (Wired) CZ-RL01P (Wireless)			
Cooling Capacity			kW	14.0			
			BTU/h	47,800			
Refrigerant Charge-less			m	30			
Standard Air Volume for High, Medium and Low Speed			m^3/min	Hi 30	Me 27	Lo 24	Hi 86
			cfm	1059	953	847	3036
Outside Dimension (H x W x D)			mm	290 x 840 x 840			1220 x 1100
			inch	11-7/16 x 33-1/24 x 33-1/24			48-1/24 x 43-5/16
Net Weight			kg	33			114
			lbs	73			251
Piping Connection	Refrigerant	Gas	mm (inch)	O.D Ø 19.05 (3/4) Flared Type			
		Liquid	mm (inch)	O.D Ø 9.52 (3/8) Flared Type			
	Drain		mm	O.D Ø 20			I.D Ø 20 x
Compressor	Type, Number of Set			-			Hermetic-1 (Sc
	Starting Method			-			Direct on-line
	Motor	Type		-			2-pole 3-phase i motor
		Input	kW	-			Cool 4.5
		Rated Output	kW	-			4.1
Fan	Type, Number of Set			Turbo fan-1			Propeller f
	Motor	Type		6-pole single phase induction motor			6-pole single induction m
		Input	kW	0.18			0.25
		Rated Output	kW	0.14			0.055 x
Air-heat Exchanger				Slit-fin type			Louvre-fin
Refrigerant Control				Capillary tube			-
Refrigerant Oil (Charged)			litre	-			SONTEX200L
Refrigerant (Charged)			kg	-			(5.0)
			lbs				(11.0)
Running Adjustment	Control Switch			Wireless or Wired Remote Control			-
	Room Temperature			Thermostat (Main Body)			-
Safety Devices				Internal protector for compressor, Internal ther fan motor, Crankcase heater, High pressure Current transformer			
Noise Level			dB	Hi 50	Me 47	Lo 45	Hi 56

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air

temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)

ELECTRICAL DATA (50Hz)

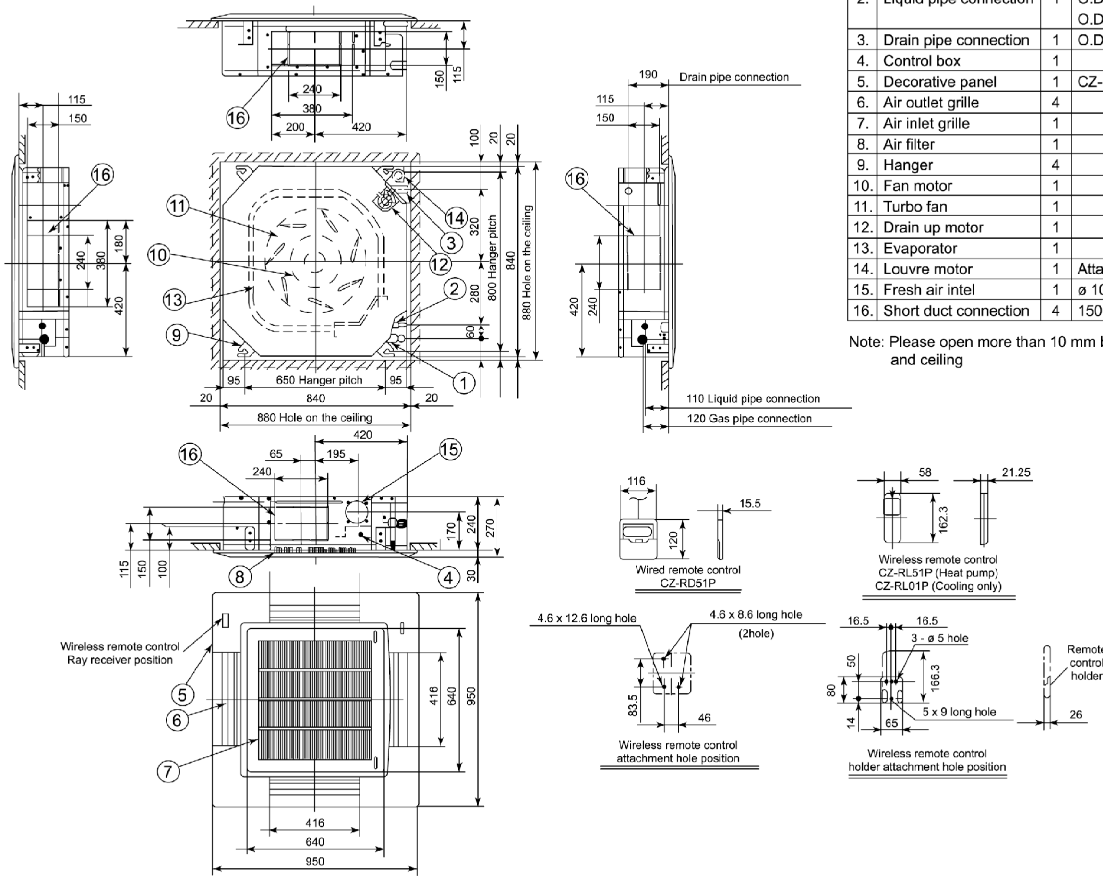
ITEM / MODEL			CS-A50BB4P, CU-C50BBP8		
			Condition by JIS B 8615		
Volts	**V**		**380**	**400**	**415**
Phase			**3N**	**3N**	**3N**
Power Consumption	**kW**	**Cool**	**4.99**	**4.99**	**4.99**
Running Current	**A**	**Cool**	**8.60**	**8.60**	**8.60**
Starting Current	**A**		**69**	**69**	**69**
Power Factor	**%**	**Cool**	**88**	**84**	**81**
***Power Factor means total figure of compressor, indoor fan motor and outdoor fan motor.**					
Panasonic	**Power source**			**AC, 3N~380V, 400V, 415V 50**	

5. TECHNICAL DRAWING

CS-A24BB4P, CS-A28BB4P

No.	Description	PC	Dimension
1.	Gas pipe connection	1	O.D ø 15.88 Flared
2.	Liquid pipe connection	1	O.D ø 6.35 Flared (CS-A24BB4P) O.D ø 9.52 Flared (CS-A28BB4P)
3.	Drain pipe connection	1	O.D ø 32
4.	Control box	1	
5.	Decorative panel	1	CZ-BT01P
6.	Air outlet grille	4	
7.	Air inlet grille	1	
8.	Air filter	1	
9.	Hanger	4	
10.	Fan motor	1	
11.	Turbo fan	1	
12.	Drain up motor	1	
13.	Evaporator	1	
14.	Louvre motor	1	Attached to decorative panel
15.	Fresh air intel	1	ø 100 slit hole
16.	Short duct connection	4	150 x 240 slit hole

Note: Please open more than 10 mm between indoor unit top face and ceiling

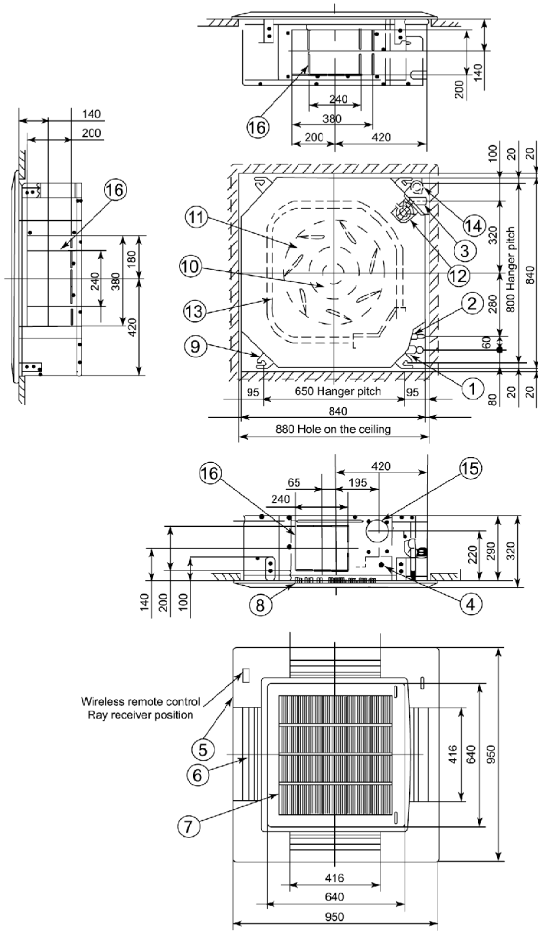


115
150
240
380
200
420
180
⑯
⑪
⑩
⑬
⑨
⑭
③
⑫
②
①
100
20
320
280
60
800 Hanger pitch
840
880 Hole on the ceiling
95
650 Hanger pitch
880 Hole on the ceiling
190
Drain pipe connection
110 Liquid pipe connection
120 Gas pipe connection
65
195
⑮
170
270
30
⑧
④
Wireless remote control
Ray receiver position
⑤
⑥
⑦
416
640
950
116
15.5
Wired remote control
CZ-RD51P
58
21.25
162.3
Wireless remote control
CZ-RL51P (Heat pump)
CZ-RL01P (Cooling only)
4.6 x 12.6 long hole
4.6 x 8.6 long hole
(2hole)
83.5
46
Wireless remote control
attachment hole position
16.5
3 - ø 5 hole
50
80
14
166.3
5 x 9 long hole
Remote
control
holder
26
Wireless remote control
holder attachment hole position

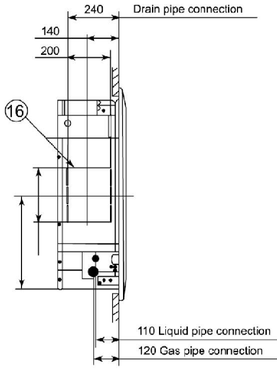
Unit : mm

CS-A34BB4P, CS-A43BB4P, CS-A50BB4P

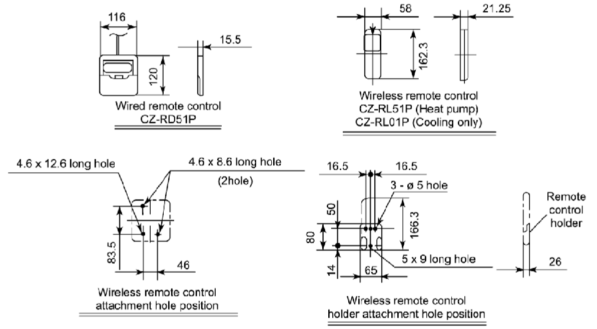
No.	Description	PC	Dimension
1.	Gas pipe connection	1	O.D ø 19.05 Flared
2.	Liquid pipe connection	1	O.D ø 9.52 Flared
3.	Drain pipe connection	1	O.D ø 32
4.	Control box	1	
5.	Decorative panel	1	CZ-BT01P
6.	Air outlet grille	4	
7.	Air inlet grille	1	
8.	Air filter	1	
9.	Hanger	4	
10.	Fan motor	1	
11.	Turbo fan	1	
12.	Drain up motor	1	
13.	Evaporator	1	
14.	Louvre motor	1	Attached to decorative panel
15.	Fresh air intel	1	ø 100 slit hole
16.	Short duct connection	4	150 x 240 slit hole



⑯
140
200
240
380
180
420
200
⑪
⑩
⑬
⑨
⑭
③
⑫
②
①
320
280
60
100
20
80
800 Hanger pitch
840
880 Hole on the ceiling
95
650 Hanger pitch
880 Hole on the ceiling
65
195
15
220
290
320
⑧
④
Wireless remote control
Ray receiver position
⑤
⑥
⑦
416
640
950



240
Drain pipe connection
140
200
⑯
110 Liquid pipe connection
120 Gas pipe connection

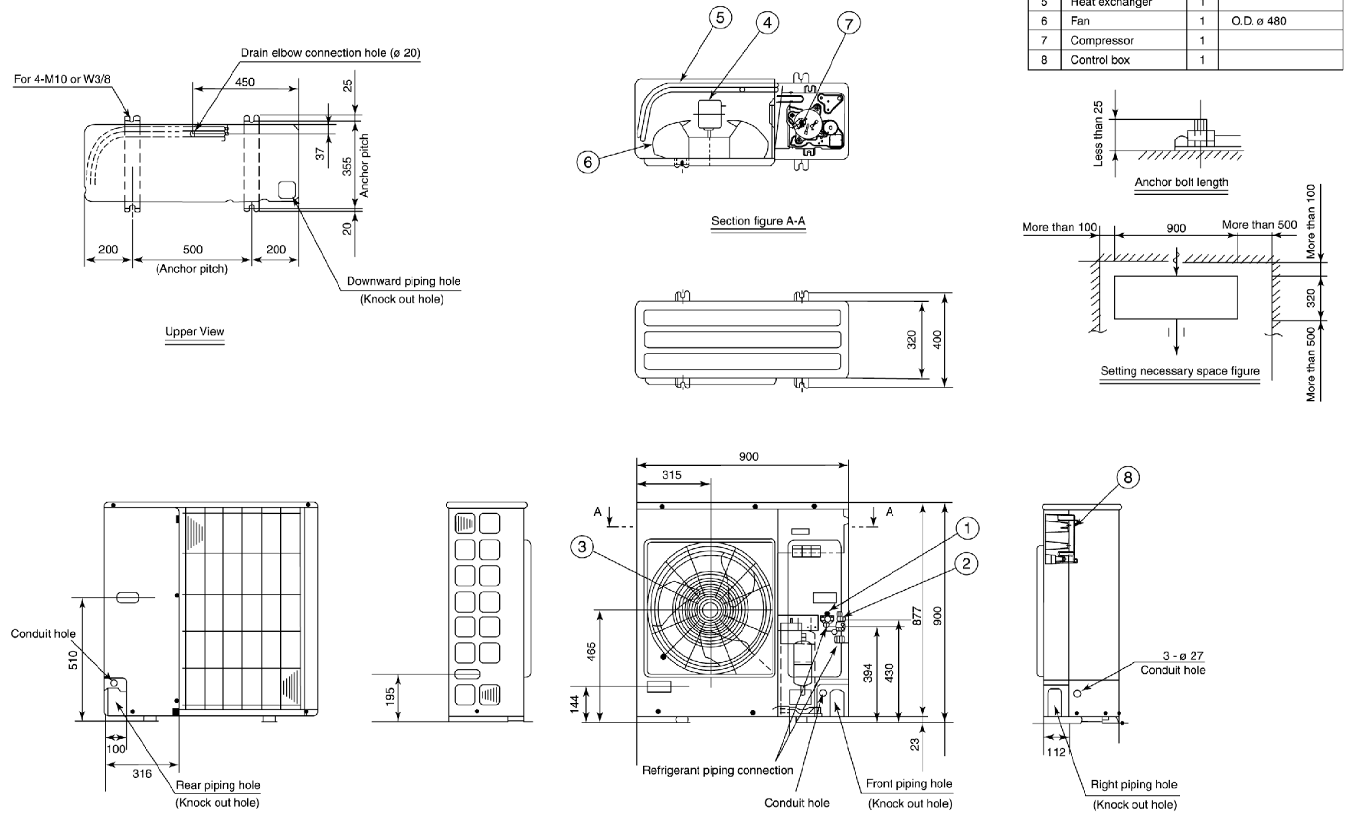


116
15.5
120
Wired remote control
CZ-RD51P
58
21.25
162.3
Wireless remote control
CZ-RL51P (Heat pump)
CZ-RL01P (Cooling only)
4.6 x 12.6 long hole
4.6 x 8.6 long hole
(2hole)
83.5
46
Wireless remote control
attachment hole position
16.5
3 - ø 5 hole
50
80
14
166.3
65
5 x 9 long hole
Wireless remote control
holder attachment hole position
Remote
control
holder
26

Unit : mm

CU-A24BBP5, CU-C24BBP5

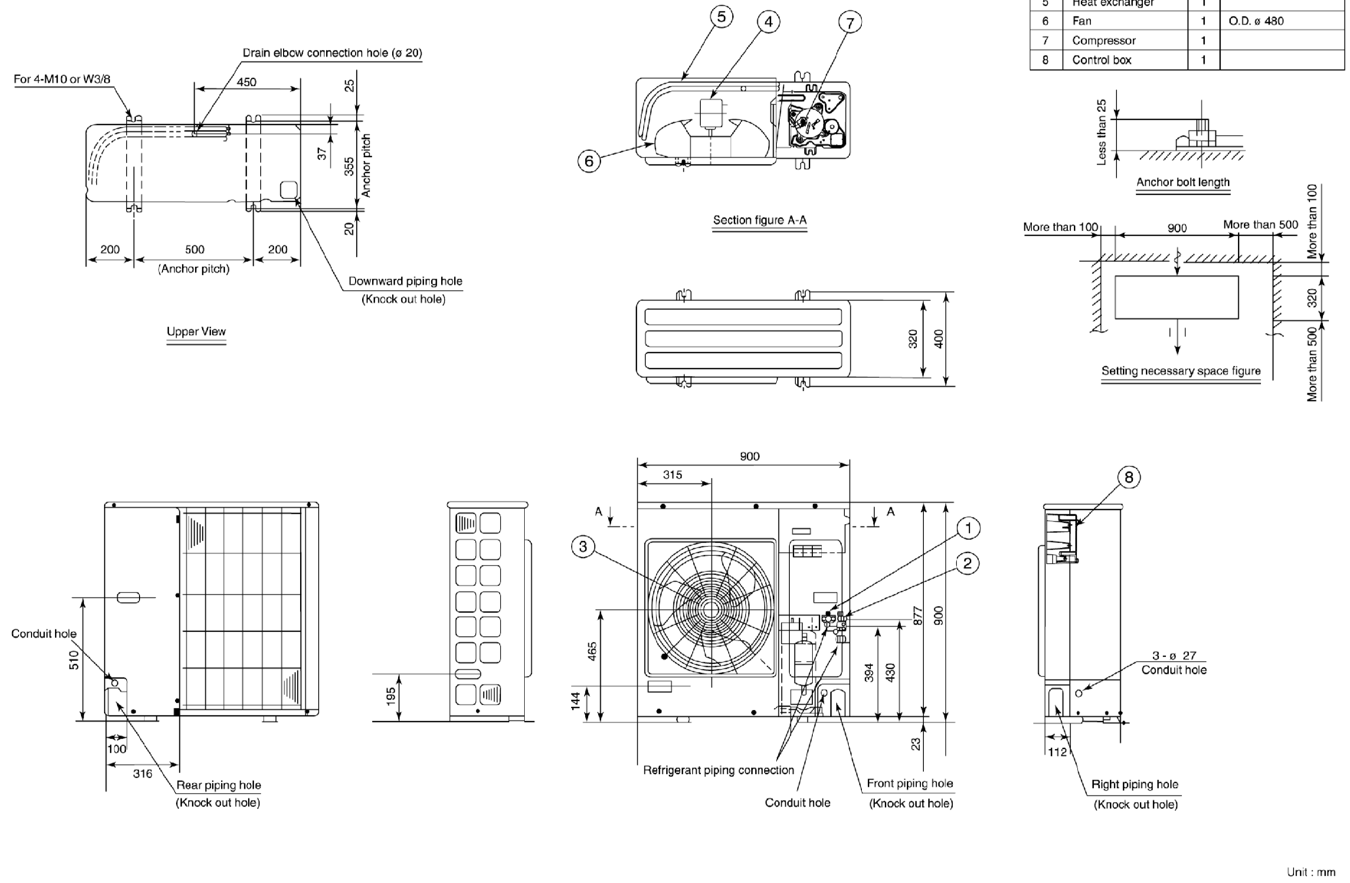
No.	Description	PC	Dimension
1	Service valve	1	O.D. ø 6.35 Flared
2	Ball valve	1	O.D. ø 15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D. ø 480
7	Compressor	1	
8	Control box	1	


For 4-M10 or W3/8
Drain elbow connection hole (ø 20)
450
25
37
355
Anchor pitch
20
200
500
(Anchor pitch)
200
Downward piping hole
(Knock out hole)
Upper View
⑤
④
⑦
⑥
Section figure A-A
320
400
Less than 25
Anchor bolt length
More than 100
900
More than 500
More than 100
320
More than 500
Setting necessary space figure
Conduit hole
510
100
316
Rear piping hole
(Knock out hole)
195
900
315
A
A
③
①
②
165
144
394
430
877
900
23
Refrigerant piping connection
Conduit hole
Front piping hole
(Knock out hole)
⑧
3 - ø 27
Conduit hole
112
Right piping hole
(Knock out hole)

Unit : mm

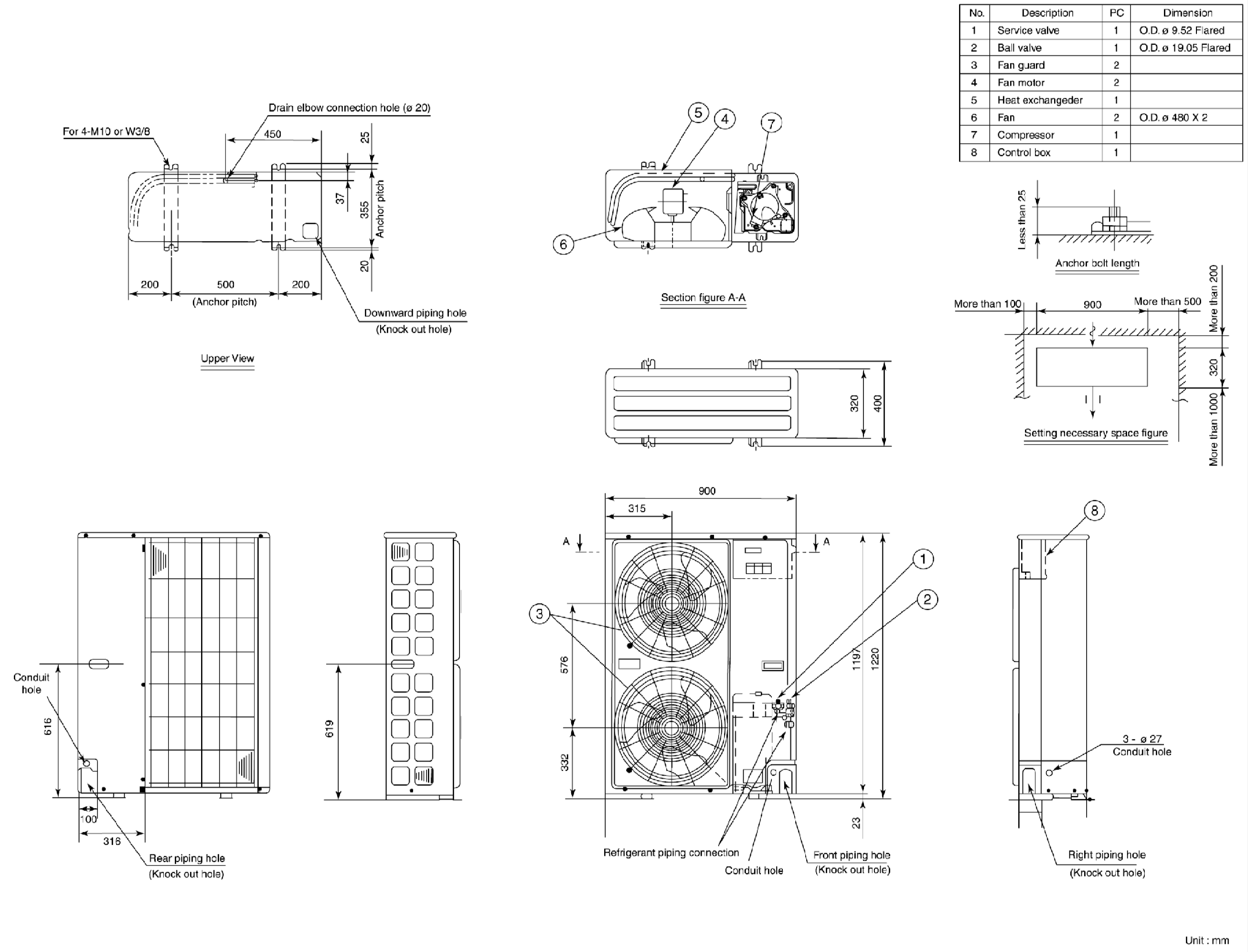
CU-A28BBP5, CU-A28BBP8, CU-C28BBP5, CU-C28BBP8, CU-C28BBP6

No.	Description	PC	Dimension
1	Service valve	1	O.D ø 9.52 Flared
2	Ball valve	1	O.D. ø 15.88 Flared
3	Fan guard	1	
4	Fan motor	1	
5	Heat exchanger	1	
6	Fan	1	O.D. ø 480
7	Compressor	1	
8	Control box	1	

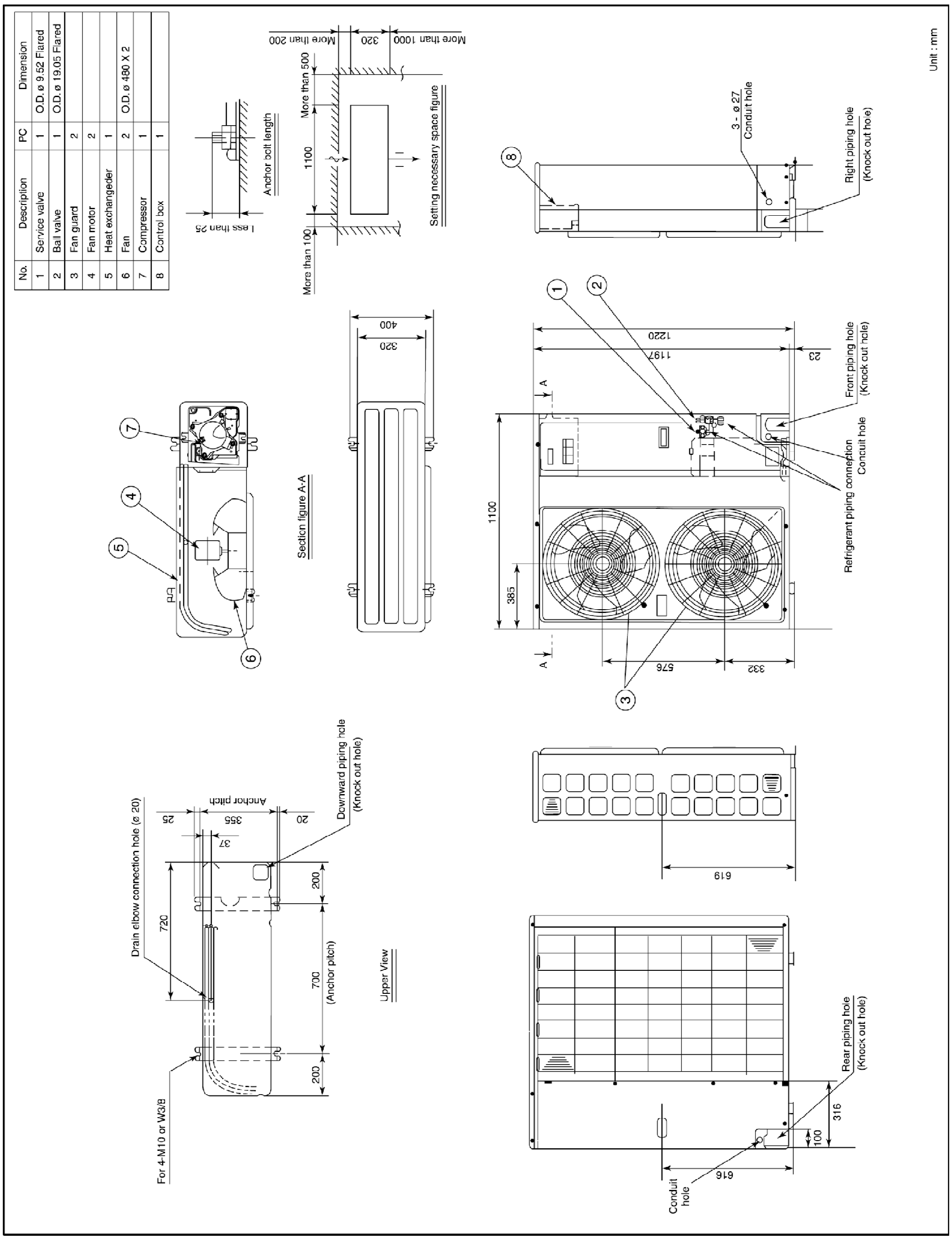

For 4-M10 or W3/8
Drain elbow connection hole (ø 20)
450
25
37
355
Anchor pitch
20
200
500
(Anchor pitch)
200
Downward piping hole
(Knock out hole)
Upper View
⑤
④
⑦
⑥
Section figure A-A
320
400
Less than 25
Anchor bolt length
More than 100
900
More than 500
More than 100
320
More than 500
Setting necessary space figure
900
315
A
A
③
①
②
465
144
394
430
877
900
23
Refrigerant piping connection
Conduit hole
Front piping hole
(Knock out hole)
⑧
3 - ø 27
Conduit hole
112
Right piping hole
(Knock out hole)
Conduit hole
510
100
316
Rear piping hole
(Knock out hole)
195
Unit : mm

CU-A34BBP5, CU-A34BBP8, CU-C34BBP5, CU-C34BBP8, CU-C34BBP7

No.	Description	PC	Dimension
1	Service valve	1	O.D. ø 9.52 Flared
2	Ball valve	1	O.D. ø 19.05 Flared
3	Fan guard	2	
4	Fan motor	2	
5	Heat exchangeder	1	
6	Fan	2	O.D. ø 480 X 2
7	Compressor	1	
8	Control box	1	


For 4-M10 or W3/8
Drain elbow connection hole (ø 20)
450
25
37
355
Anchor pitch
20
200
500
(Anchor pitch)
200
Downward piping hole
(Knock out hole)
Upper View
⑤ ④ ⑦ ⑥
Section figure A-A
Less than 25
Anchor bolt length
More than 100
900
More than 500
More than 200
320
More than 1000
Setting necessary space figure
320
400
900
315
A
A
①
②
③
576
332
1197
1220
23
Refrigerant piping connection
Conduit hole
Front piping hole
(Knock out hole)
⑧
3 - ø 27
Conduit hole
Right piping hole
(Knock out hole)
Conduit
hole
616
100
318
Rear piping hole
(Knock out hole)
619
Unit : mm

CU-A43BBP8, CU-A50BBP8, CU-C43BBP8, CU-C50BBP8, CU-C43BBP7, CU-C50BBP7

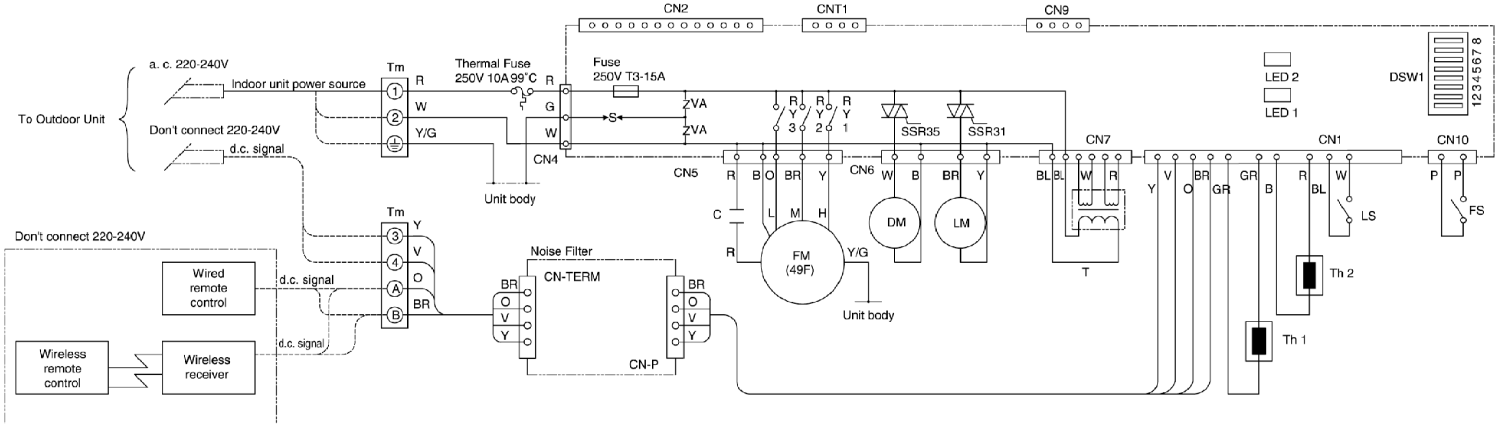


No.	Description	PC	Dimension
1	Service valve	1	O.D. ø 9.52 Flared
2	Ball valve	1	O.D. ø 19.05 Flared
3	Fan guard	2	
4	Fan motor	2	
5	Heat exchangeder	1	
6	Fan	2	O.D. ø 480 X 2
7	Compressor	1	
8	Control box	1	

Unit : mm
More than 200
320
More than 1000
More than 500
1100
More than 100
Less than 25
Anchor bolt length
Setting necessary space figure
3 - ø 27
Conduit hole
Right piping hole
(Knock out hole)
⑧
①
②
1220
1197
23
Front piping hole
(Knock out hole)
Conduit hole
Refrigerant piping connection
A
1100
385
576
332
③
400
320
Section figure A-A
⑦
④
⑤
⑥
Drain elbow connection hole (ø 20)
Anchor pitch
25
355
20
37
Downward piping hole
(Knock out hole)
720
200
700
(Anchor pitch)
200
Upper View
For 4-M10 or W3/8
619
Rear piping hole
(Knock out hole)
316
100
616
Conduit
hole

6. CIRCUIT DIAGRAM

CS-A24BB4P, CS-A28BB4P, CS-A34BB4P, CS-A43BB4P, CS-A50BB4P


CN2
CNT1
CN9
a. c. 220-240V
Indoor unit power source
To Outdoor Unit
Don't connect 220-240V
d.c. signal
Tm
R
W
Y/G
Thermal Fuse
250V 10A 99°C
R
G
W
CN4
Unit body
Fuse
250V T3-15A
S
ZVA
ZVA
R Y 3
R Y 2
R Y 1
SSR35
SSR31
CN5
R
B O
BR
Y
CN6
W
B
BR
Y
C
L
M
H
FM
(49F)
Y/G
Unit body
DM
LM
CN7
BL BL
W
R
T
LED 2
LED 1
DSW1
1 2 3 4 5 6 7 8
CN1
Y
V
O
BR
GR
GR
B
R
BL
W
LS
Th 2
Th 1
CN10
P
P
FS
Don't connect 220-240V
Wired remote control
Wireless remote control
Wireless receiver
d.c. signal
d.c. signal
Tm
Y
V
O
BR
③
④
Ⓐ
Ⓑ
Noise Filter
CN-TERM
BR
O
V
Y
CN-P
BR
O
V
Y

CAUTION

Terminal No. ③④ⒶⒷ
are d. c. signal circuit.
DO NOT SUPPLY 220V - 240V

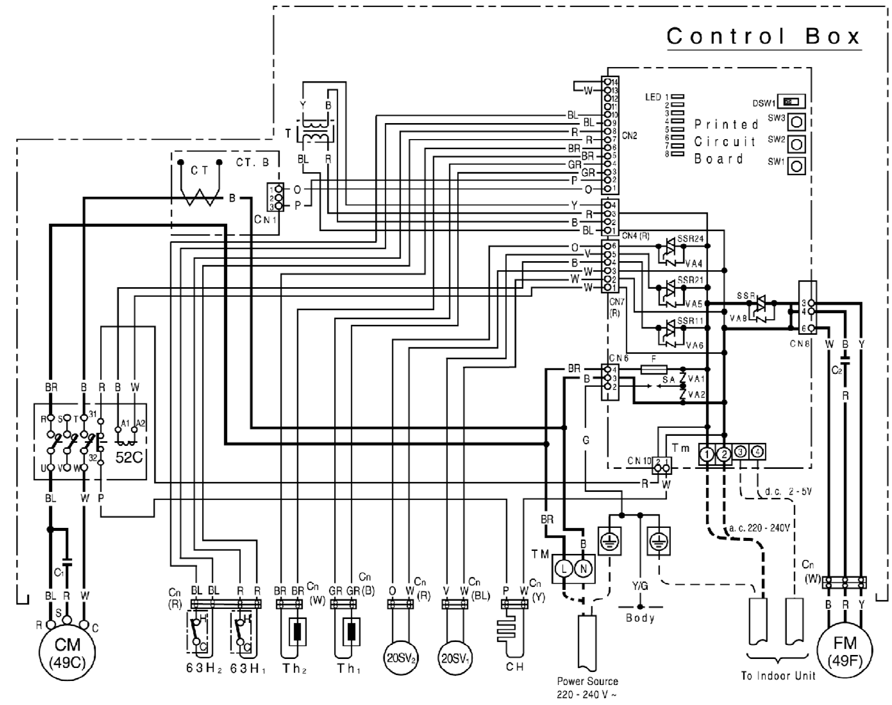
WIRE COLOUR

R	RED	G	GREEN
Y	YELLOW	BR	BROWN
Y/G	YELLOW/GREEN	B	BLUE
O	ORANGE	BL	BLACK
W	WHITE	GR	GREY
V	VIOLET		

LEGEND

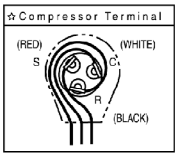
FM	Fan Motor	T	Transformer
DM	Drain Motor	**LS**	Louvre Switch
FS	Float Switch	Th 1	Indoor Temperature Thermistor
C	Capacitor	Th 2	Pipe Temperature Thermistor
49F	Internal Thermostat for FM	**LM**	Louvre Motor
Tm	Terminal Board for Control Unit	S	Surge Absorber
RY1,2,3	Relay for Fan Motor	VA	Varistor
SSR31,35	Solid-state Relay		

CU-A24BBP5, CU-A28BBP5



Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT
CT. B
T
SSR24
SSR21
SSR11
SSR
VA1
VA2
VA4
VA5
VA6
VA8
F
SA
Tm
52C
C1
C2
CM (49C)
FM (49F)
63H2
63H1
Th2
Th1
20SV2
20SV1
CH
TM
L
N
Y/G
Body
Power Source 220 - 240 V ~
To Indoor Unit
d.c. 2 - 5V
a.c. 220 - 240V
Cn (R)
Cn (W)
Cn (B)
Cn (R)
Cn (BL)
Cn (Y)
Cn (W)

☆Compressor Terminal



(RED)
(WHITE)
S
C
R
(BLACK)

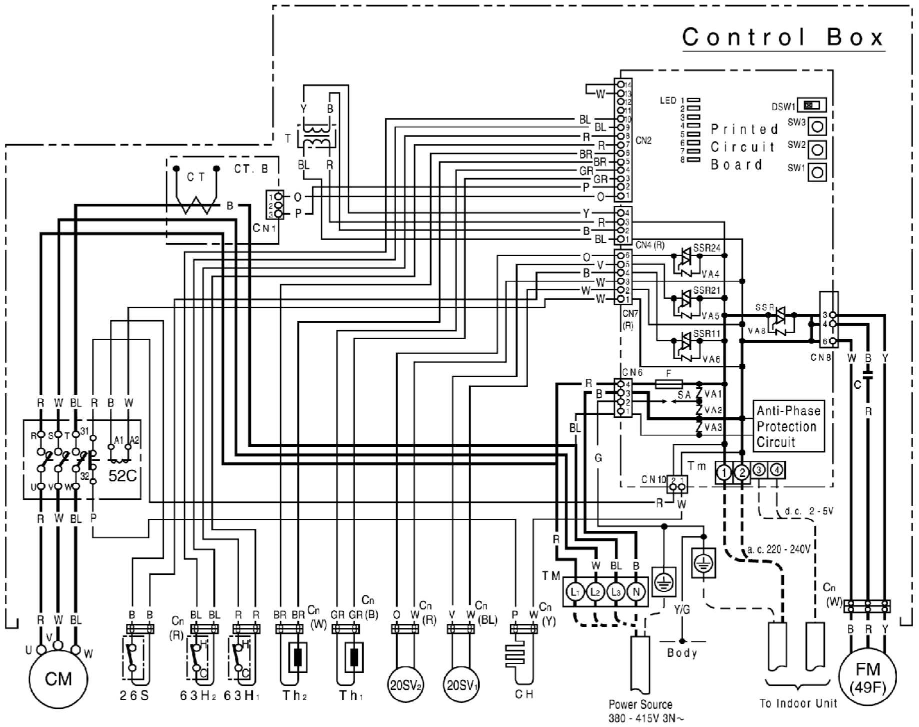
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

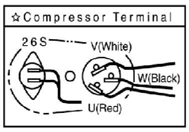
LEGEND

CM	Compressor Motor	$20SV_1$	Reversing Valve	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
C_1	Capacitor for CM	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
C_2	Capacitor for FM	Th_1	Thermistor (Compressor discharge temp.)	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{1,11}$	Solid State Relay
$63H_1$	High Pressure Switch	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
$63H_2$	High Pressure Switch Heat-pump	Cn	Connector	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM	T	Transformer		
49F	Internal Protector for FM				

CU-A28BBP8


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
T
Y B
BL R
CT
CT. B
SSR24
SSR21
SSR11
SSR
VA4
VA5
VA6
VA8
VA1
VA2
VA3
F
SA
Anti-Phase Protection Circuit
Tm
① ② ③ ④
d.c. 2 - 5V
a.c. 220 - 240V
TM
L1 L2 L3 N
Y/G
Body
Power Source 380 - 415V 3N~
To Indoor Unit
52C
A1 A2
31 32
R S T
U V W
CM
26S
63H2
63H1
Th2
Th1
20SV2
20SV1
CH
FM (49F)
C
Cn (R)
Cn (W)
Cn (B)
Cn (BL)
Cn (Y)
W B Y
B R Y

WIRE COLOUR

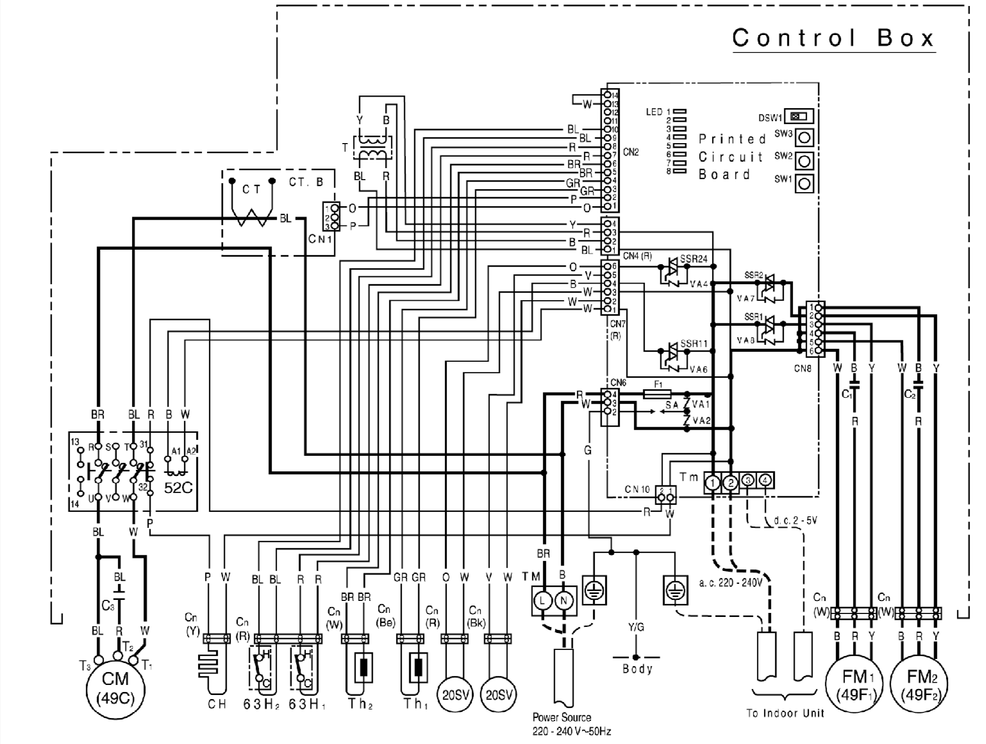

☆Compressor Terminal
26S
V(White)
W(Black)
U(Red)

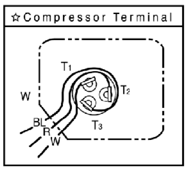
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

				Printed Circuit Board	
CM	Compressor Motor	$20SV_1$	Reversing Valve		
FM	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
C	Capacitor for FM	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_1	Thermistor (Compressor discharger temp.)	$CN_{1\sim10}$	Connector
$63H_1$	High Pressure Switch	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{1,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
Cn	Connector	T	Transformer	Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM	26S	Bimetal Thermostat for OM		

CU-A34BBP5


Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN1
CN4 (R)
CN7 (R)
CN6
CN8
CN 10
CT
CT. B
T
SSR24
SSR11
SSR2
SSR1
VA1
VA2
VA4
VA6
VA7
VA8
SA
F1
Tm
TM
52C
CM (49C)
FM1 (49F1)
FM2 (49F2)
C1
C2
C3
CH
63H2
63H1
Th2
Th1
20SV
20SV
Body
Y/G
a. c. 220 - 240V
d. c. 2 - 5V
Power Source 220 - 240 V~50Hz
To Indoor Unit


☆Compressor Terminal
T1
T2
T3
W
BL
R
W

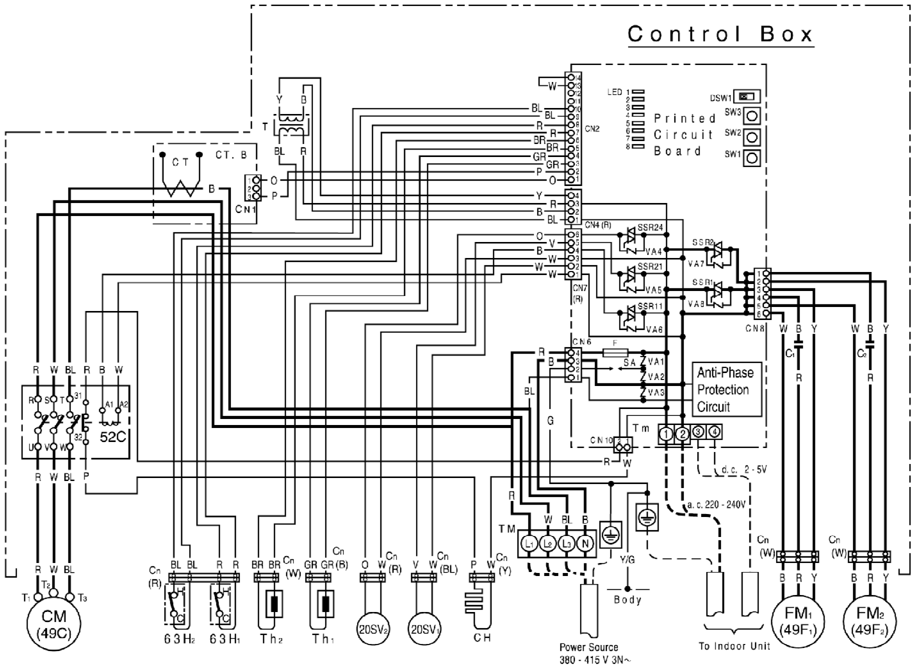
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

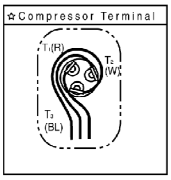
LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT.B	Current Trans Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capactor for FM	Th_2	Thermistor (Heat exchanger outlet temp.)	F_1	Fuse 250V T 6.3A
C_3	Capactor for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Cn	Connector	$SSR_{1,2}$	Solid State Relay
$63H_1$	High Pressure Switch	T	Transformer	$SSR_{11,24}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat pump	$20SV_1$	Reversing Valve	Tm	Terminal Board for Control Circuit
49C	Internal Protector for CM	$20SV_2$	Bypass Magnetic Valve		
$49F_{1,2}$	Internal Protector for FM				

CU-A34BBP8, CU-A43BBP8, CU-A50BBP8



Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT
CT. B
T
SSR24
SSR21
SSR11
SSR2
SSR1
VA1
VA2
VA3
VA4
VA5
VA6
VA7
VA8
SA
F
Anti-Phase Protection Circuit
Tm
TM
52C
d.c. 2 - 5V
a.c. 220 - 240V
Body
Y/G
Power Source 380 - 415 V 3N~
To Indoor Unit
CM (49C)
63H₂
63H₁
Th₂
Th₁
20SV₂
20SV₁
CH
FM₁ (49F₁)
FM₂ (49F₂)
C₁
C₂
Cn


☆Compressor Terminal

T₁(R)
T₂ (W)
T₃ (BL)

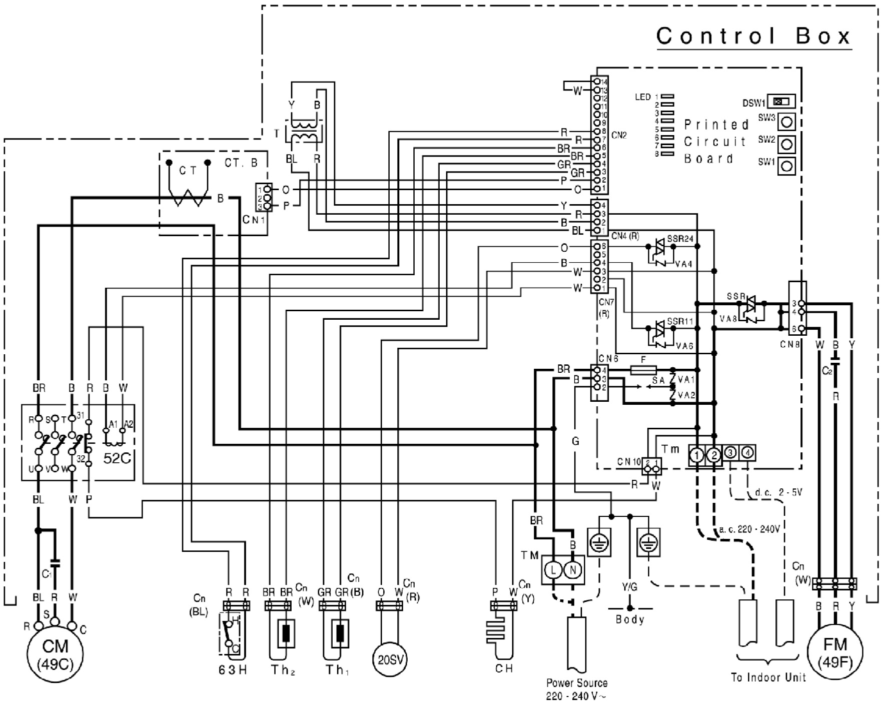
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

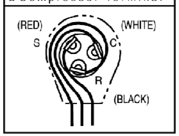
LEGEND

CM	Compressor Motor	$20SV_1$	Reversing Valve	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	$20SV_2$	Bypass Magnetic Valve	SA	Surge Absorber
52C	Magnetic Contactor for CM	TM	Terminal Board for Main Circuit	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	CT.B	Current Trans Board	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	Th_1	Thermistor (Compressor discharger temp.)	$CN_{1\sim10}$	Connector
$63H_1$	High Pressure Switch	Th_2	Thermistor (Heat exchanger outlet temp.)	$SSR_{12,11}$	Solid State Relay
$63H_2$	High Pressure Switch on Heat-pump	CT	Current Transformer	$SSR_{21,24}$	Solid State Relay
Cn	Connector	49C	Internal Protector for CM	Tm	Terminal Board for Control Circuit
T	Transformer	$49F_{1,2}$	Internal Protector for $FM_{1,2}$		

CU-C24BBP5, CU-C28BBP5, CU-C28BBP6


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
SSR24
SSR11
SSR
VA4
VA6
VA8
VA1
VA2
SA
F
Tm
① ② ③ ④
CT
CT. B
T
52C
A1 A2
31 32
TM
L N
C1
C2
CM (49C)
FM (49F)
63H
Th2
Th1
20SV
CH
Cn (BL)
Cn (W)
Cn (B)
Cn (R)
Cn (Y)
Cn (W)
Y/G
Body
Power Source 220 - 240 V ~
To Indoor Unit
a. c. 220 - 240V
d. c. 2 - 5V
G
R S T
U V W
BR B R B W
BL W P
BL R W
R S C
R R BR BR GR GR O W
P W
W B Y
B R Y

☆Compressor Terminal


(RED)
(WHITE)
S
C
R
(BLACK)

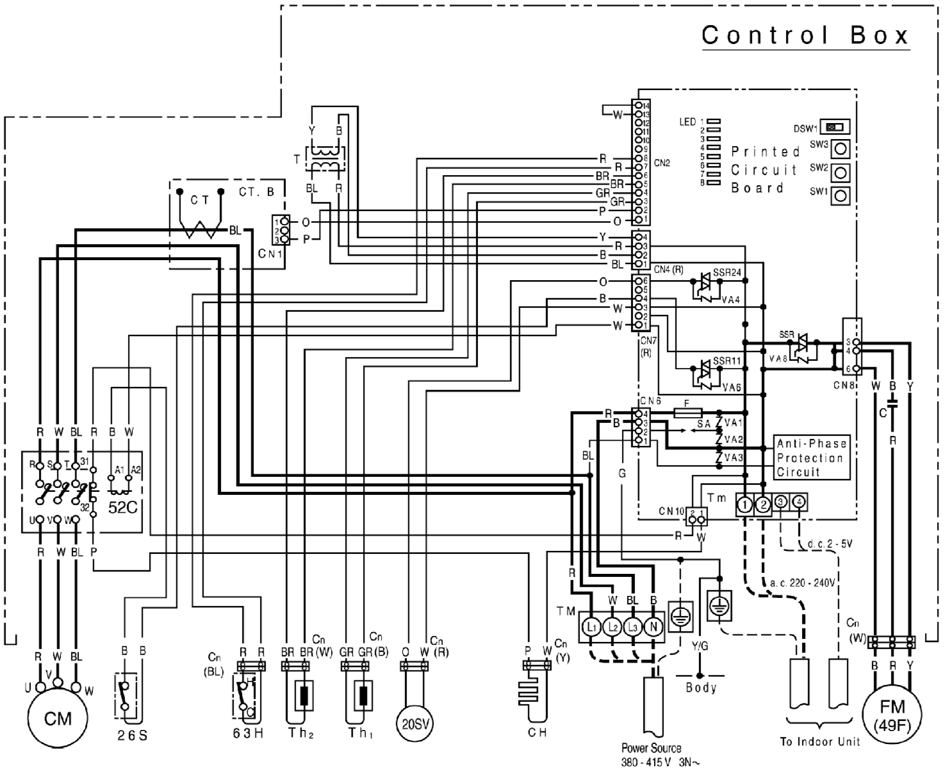
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

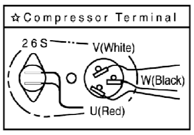
LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	CT.B	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
C_1	Capacitor for CM	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
C_2	Capacitor for FM	CT	Current Transformer	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Cn	Connector	$SSR_{1,11}$	Solid State Relay
63H	High Pressure Switch	T	Transformer	$SSR_{21,24}$	Solid State Relay
49C	Internal Protector for CM			Tm	Terminal Board for Control Circuit
49F	Internal Protector for FM				
20SV	Bypass Magnetic Valve				

CU-C28BBP8



Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
SSR24
SSR11
SSR
VA4
VA6
VA8
VA1
VA2
VA3
SA
F
Anti-Phase Protection Circuit
Tm
CT
CT. B
T
52C
TM
CM
26S
63H
Th2
Th1
20SV
CH
Cn (BL)
Cn (W)
Cn (B)
Cn (R)
Cn (Y)
Cn (W)
d.c 2 - 5V
a.c. 220 - 240V
Y/G
Body
Power Source
380 - 415V 3N~
To Indoor Unit
FM
(49F)
C



☆Compressor Terminal
26S
V(White)
W(Black)
U(Red)

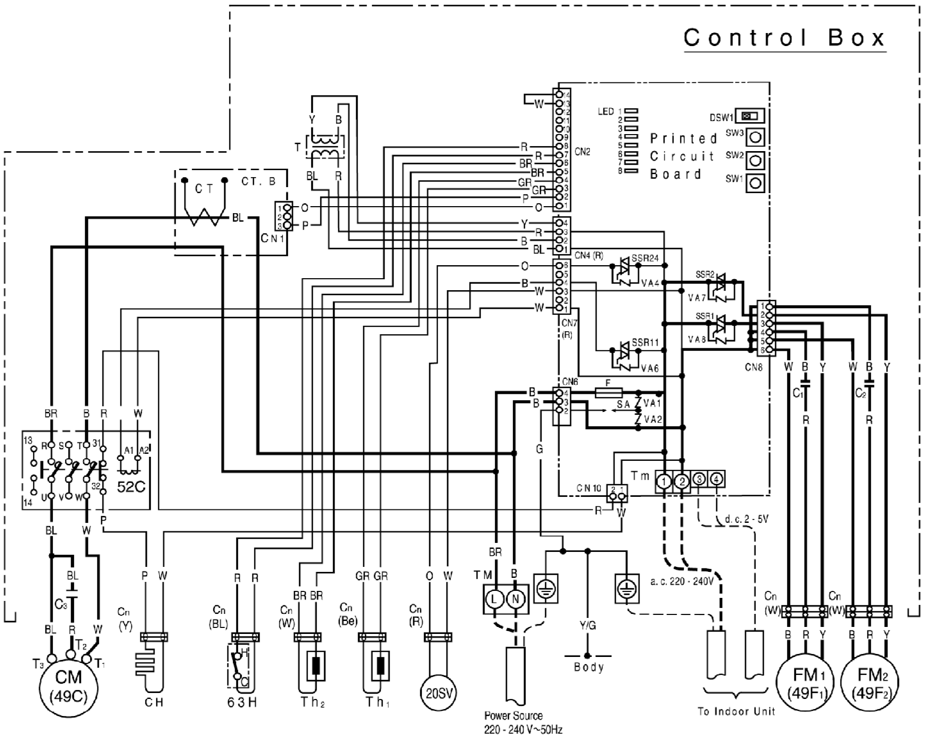
WIRE COLOUR

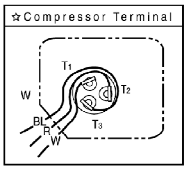
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
FM	Fan Motor (Outdoor Unit)	CT.B	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
C	Capacitor for FM	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
63H	High Pressure Switch	T	Transformer	$SSR_{1,11}$	Solid State Relay
Cn	Connector	26S	Bimetal Thermostat for CM	$SSR_{21,24}$	Solid State Relay
49F	Internal Protector for FM			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				

CU-C34BBP5


Control Box
Printed Circuit Board
LED
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
SSR24
VA4
SSR2
VA7
SSR1
VA8
CN8
CN7 (R)
SSR11
VA6
CN6
F
SA
VA1
VA2
CN 10
Tm
d.c. 2 - 5V
a.c. 220 - 240V
T
CT
CT. B
CN1
52C
CM (49C)
T1
T2
T3
C3
CH
63H
Th2
Th1
20SV
Cn (Y)
Cn (BL)
Cn (W)
Cn (Be)
Cn (R)
TM
L
N
Power Source 220 - 240 V~50Hz
Y/G
Body
To Indoor Unit
C1
C2
FM1 (49F1)
FM2 (49F2)


☆Compressor Terminal
T1
T2
T3
W
BL
R
W

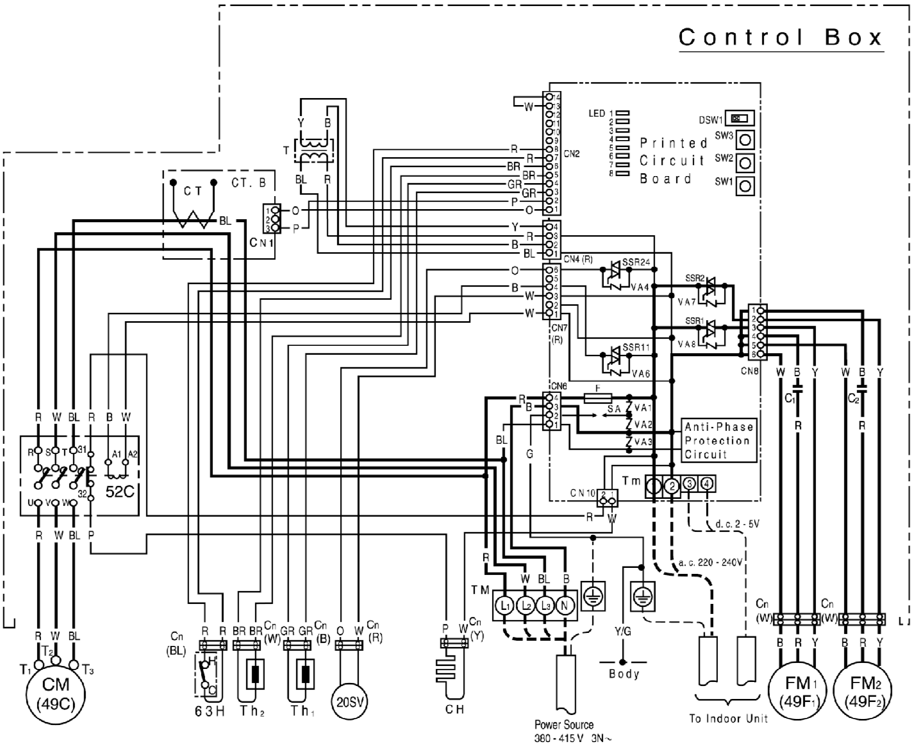
WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

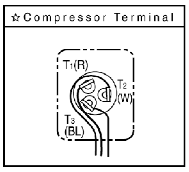
LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT.B	Current Trans Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for FM	Th_2	Thermistor (Heat exchanger outlet temp.)	F_1	Fuse 250V T 6.3A
C_3	Capacitor for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
CH	Crankcase Heater for CM	Cn	Connector	$SSR_{1,2}$	Solid State Relay
63H	High Pressure Switch	T	Transformer	$SSR_{11,24}$	Solid State Relay
49C	Internal Protector for CM	20SV	Bypass Magnetic Valve	Tm	Terminal Board for Control Circuit
$49F_{1,2}$	Internal Protector for FM				

CU-C34BBP8, CU-C43BBP8, CU-C50BBP8


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN1
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CT
CT. B
T
SSR24
SSR11
SSR2
SSR1
VA4
VA6
VA7
VA8
VA1
VA2
VA3
SA
F
Anti-Phase Protection Circuit
Tm
d.c. 2 - 5V
a.c. 220 - 240V
52C
A1 A2
TM
L1 L2 L3 N
C1
C2
Cn (W)
Cn (BL)
Cn (B)
Cn (R)
Cn (Y)
T1
T2
T3
CM (49C)
63H
Th2
Th1
20SV
CH
Y/G
Body
Power Source
380 - 415 V 3N~
To Indoor Unit
FM1 (49F1)
FM2 (49F2)

☆Compressor Terminal


T1(R)
T2 (W)
T3 (BL)

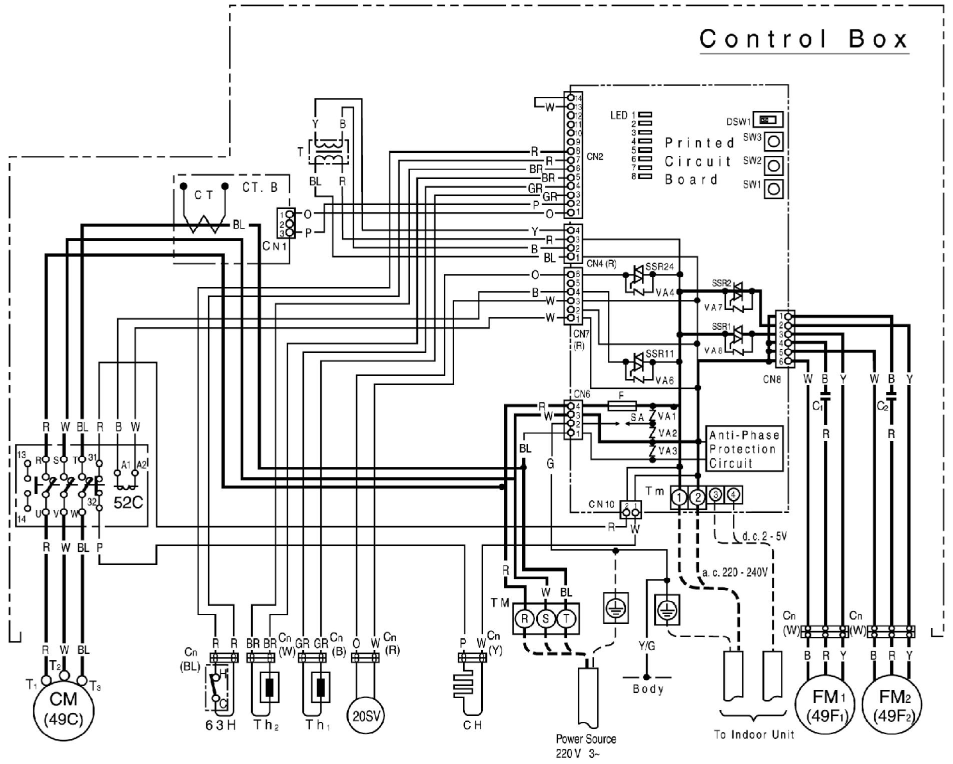
WIRE COLOUR

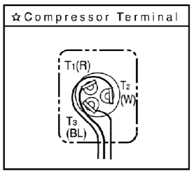
R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit		Printed Circuit Board
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT.B	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
63H	High Pressure Switch	49C	Internal Protector for CM	$SSR_{1,2,11}$	Solid State Relay
Cn	Connector	$49F_{1,2}$	Internal Protector for FM	$SSR_{21,24}$	Solid State Relay
T	Transformer			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				

CU-C34BBP7, CU-C43BBP7, CU-C50BBP7


Control Box
Printed Circuit Board
LED 1 2 3 4 5 6 7 8
DSW1
SW3
SW2
SW1
CN2
CN4 (R)
CN7 (R)
CN6
CN8
CN10
CN1
CT
CT. B
T
SSR24
SSR11
SSR2
SSR1
VA1
VA2
VA3
VA4
VA6
VA7
VA8
SA
F
Anti-Phase Protection Circuit
Tm
d.c.2 - 5V
a.c.220 - 240V
52C
TM
CM (49C)
T1
T2
T3
63H
Th2
Th1
20SV
CH
Cn
Power Source 220V 3~
Body
Y/G
To Indoor Unit
C1
C2
FM1 (49F1)
FM2 (49F2)


☆Compressor Terminal
T1(R)
T2 (W)
T3 (BL)

WIRE COLOUR

R	RED	W	WHITE	BL	BLACK
Y	YELLOW	BR	BROWN	V	VIOLET
B	BLUE	P	PINK	G	GREEN
O	ORANGE	GR	GREY		
Y/G	YELLOW / GREEN				

LEGEND

CM	Compressor Motor	TM	Terminal Board for Main Circuit	Printed Circuit Board	
$FM_{1,2}$	Fan Motor (Outdoor Unit)	CT.B	Current Transformer Board	SA	Surge Absorber
52C	Magnetic Contactor for CM	Th_1	Thermistor (Compressor discharge temp.)	$VA_{1\sim8}$	Varistor
$C_{1,2}$	Capacitor for $FM_{1,2}$	Th_2	Thermistor (Heat exchanger outlet temp.)	F	Fuse 250V T 6.3A
CH	Crankcase Heater for CM	CT	Current Transformer	$CN_{1\sim10}$	Connector
63H	High Pressure Switch	49C	Internal Protector for CM	$SSR_{1,2,11}$	Solid State Relay
Cn	Connector	$49F_{1,2}$	Internal Protector for FM	$SSR_{21,24}$	Solid State Relay
T	Transformer			Tm	Terminal Board for Control Circuit
20SV	Bypass Magnetic Valve				

APPLICABLE FOR ALL MODELS

- INDOOR UNIT
  PRINTED CIRCUIT BOARD

S PHASE	4
SURGE ABSORBER	3
——————	2
R PHASE	1

CN4

INDOOR FAN H	6
INDOOR FAN M	5
INDOOR FAN L	4
——————	3
COM	2
COM (SPH)	1

CN5

AIR SWING LOUVRE MOTOR	6
HEATER	5
DRAIN PUMP	4
COM	3
COM	2
COM (SPH)	1

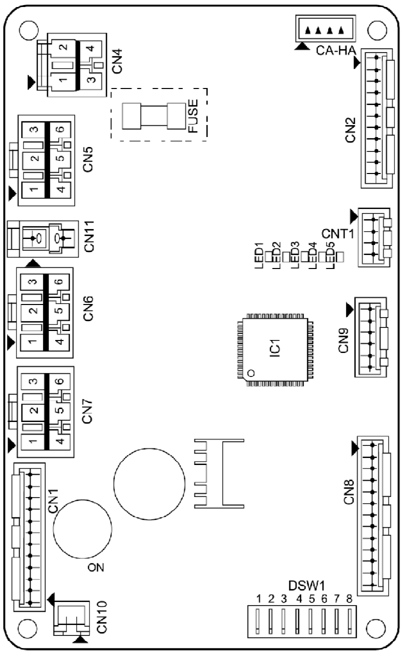
CN6

TRANSFORMER 1ST (R PH)	6
TRANSFORMER 2ND	5
TRANSFORMER	4
TRANSFORMER 1ST (S PH)	3
TRANSFORMER 2ND	2
TRANSFORMER	1

CN7

ROOM THERMISTOR	12
ROOM THERMISTOR	11
PIPE THERMISTOR	10
PIPE THERMISTOR	9
——————	8
——————	7
LOUVRE SW	6
LOUVRE SW	5
COMMUNICATION WITH OUTDOOR UNIT	4
COMMUNICATION WITH OUTDOOR UNIT	3
WIRED REMOTE CONTROL	2
WIRED REMOTE CONTROL	1

CN1



CN4
1
2
3
4
FUSE
CA-HA
CN2
CN5
1
2
3
4
5
6
CN11
CNT1
LED1
LED2
LED3
LED4
LED5
CN6
1
2
3
4
5
6
IC1
CN9
CN7
1
2
3
4
5
6
CN8
CN1
ON
DSW1
1 2 3 4 5 6 7 8
CN10

FLOAT SW	2
FLOAT SW	1

CN10

APPLICABLE FOR ALL MODELS

● OUTDOOR UNIT PRINTED CIRCUIT BOARD

CN2

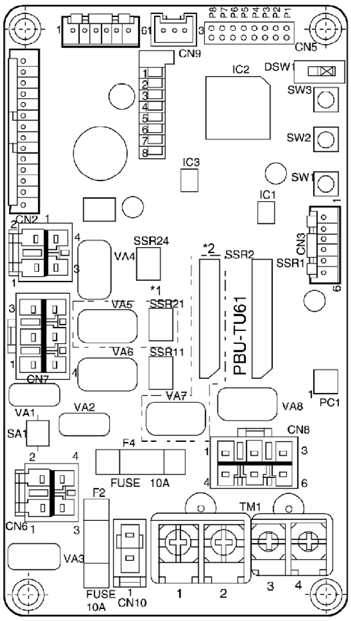
———	14
———	13
GND	12
DEMAND INPUT	11
GND	10
HEATING PRESSURE SW	9
GND	8
HIGH PRESSURE SW	7
GND	6
PIPE TEMP SENSOR	5
GND	4
DISCHARGE TEMP SENSOR	3
GND	2
CT	1

*1. HEAT PUMP MODEL ONLY

*2. CU-34BB type
CU-43BB type } Model only
CU-50BB type

TM1

COMMUNICATION WITH INDOOR UNIT	4
COMMUNICATION WITH INDOOR UNIT	3
S Phase	2
R Phase	1


P8 P7 P6 P5 P4 P3 P2 P1
1
6
1
3
CN9
CN5
1 2 3 4 5 6 7 8
IC2
DSW1
SW3
SW2
SW1
IC3
IC1
CN3
1
6
CN2 1
2
4
3
1
VA4
SSR24
*2
SSR2
SSR1
*1
VA5
SSR21
PBU-TU61
3
1
4
CN7
VA6
SSR11
VA7
VA8
1
PC1
VA1
VA2
SA1
CN8
F4
2
4
1
3
4
6
FUSE 10A
F2
TM1
CN6
1
3
VA3
FUSE 10A
1
CN10
1
2
3
4

CN8

S Phase	1
Fan2(R)	2
Fan1(R)	3
S Phase	4
S Phase	5
S Phase	6

CN4

TRANSFORMER 2ND(S)	4
TRANSFORMER 1ST(R)	3
TRANSFORMER 2ND(R)	2
TRANSFORMER 1ST(S)	1

CN10

CRANKCASE HEATER(S)	1
CRANKCASE HEATER(R)	2

CN7

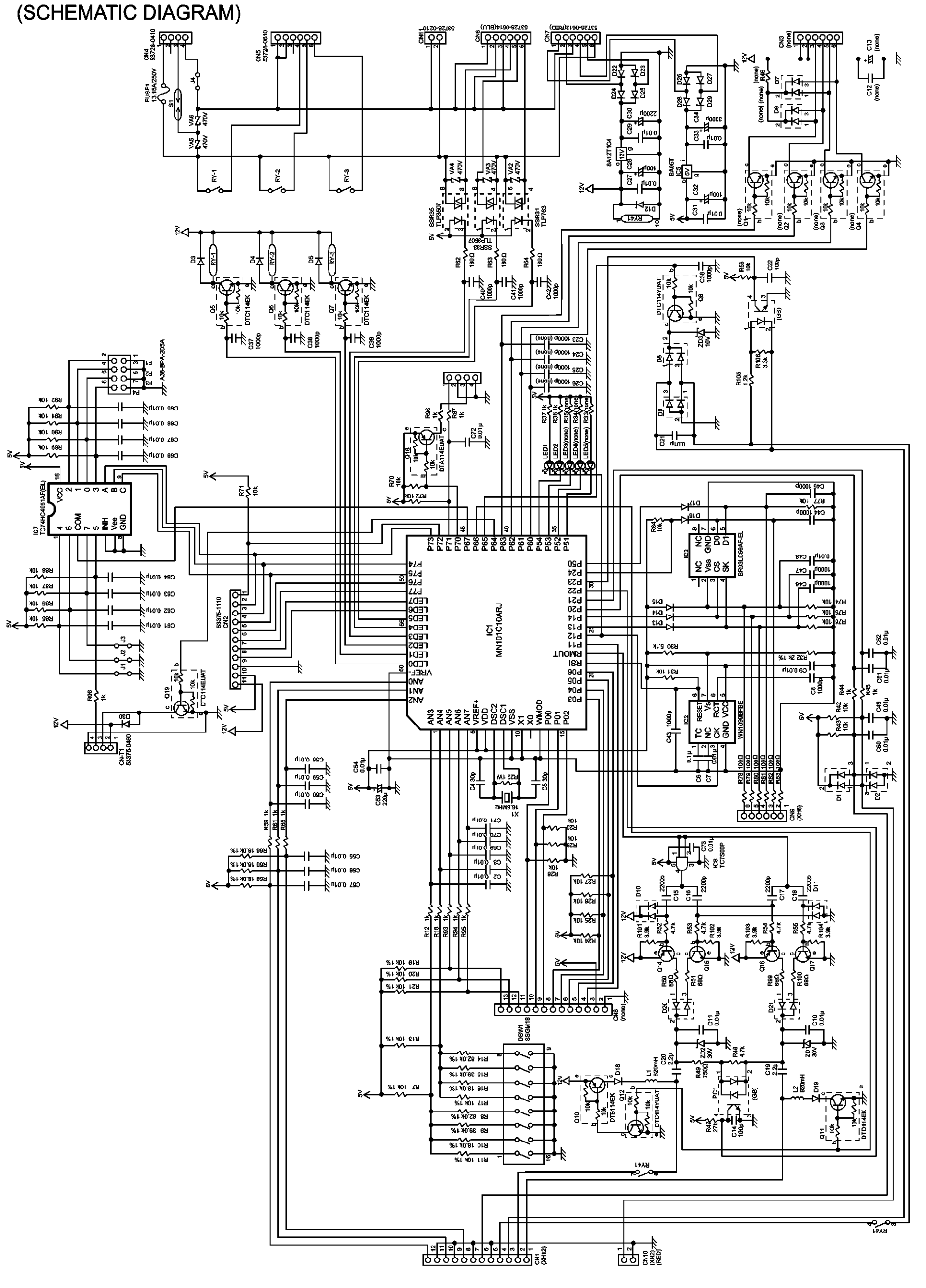
LIQUID BYPASS valve(R)	6
REVERSING valve(R)	5
COMPRESSOR relay(R)	4
LIQUID BYPASS valve(S)	3
REVERSING valve(S)	2
COMPRESSOR relay(S)	1

CN6

R Phase	4
S Phase	3
Earth	2
T Phase	1

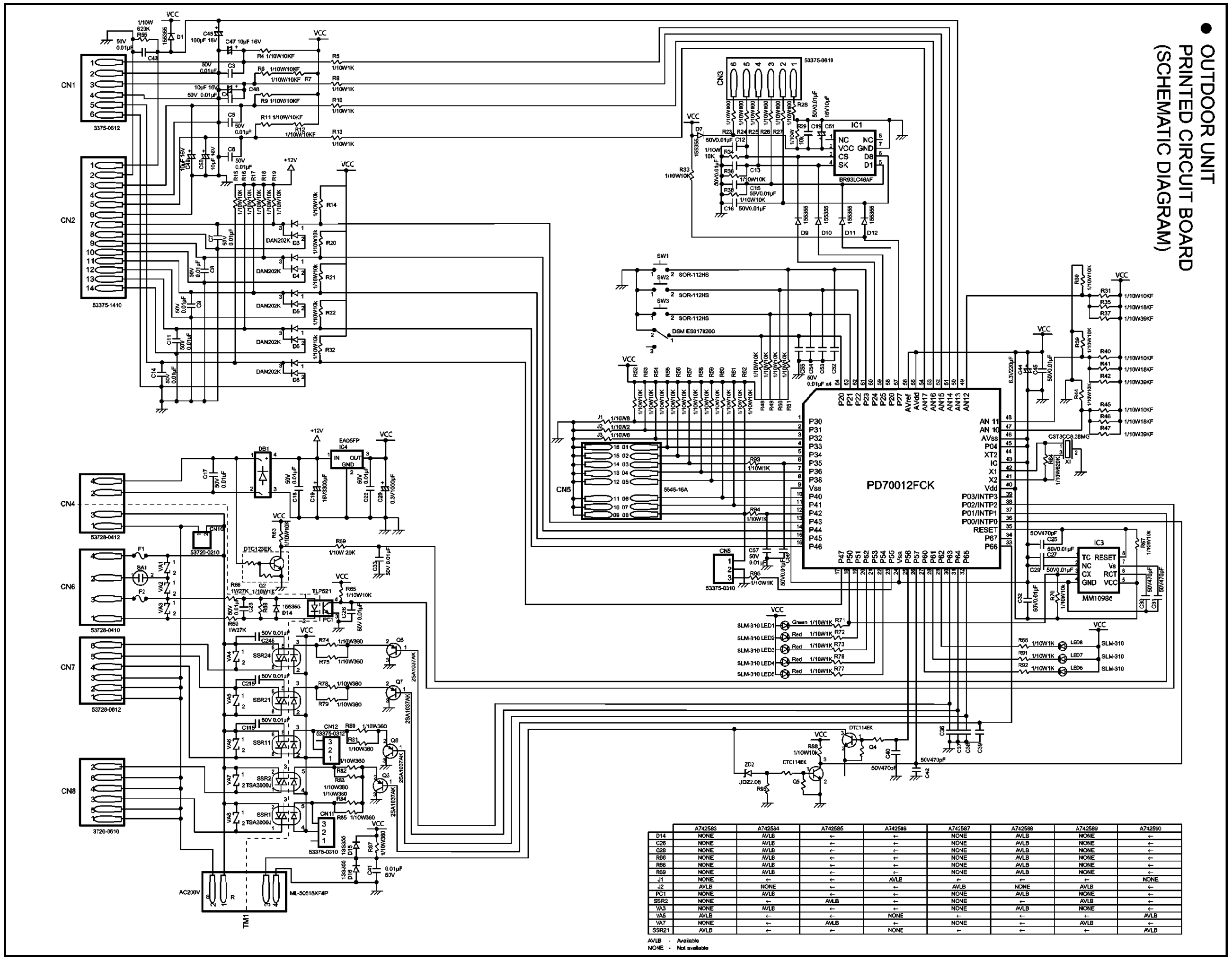
APPLICABLE FOR ALL MODELS

● INDOOR UNIT
PRINTED CIRCUIT BOARD
(SCHEMATIC DIAGRAM)


IC1
MN101C10ARJ

APPLICABLE FOR ALL MODELS

● OUTDOOR UNIT PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)

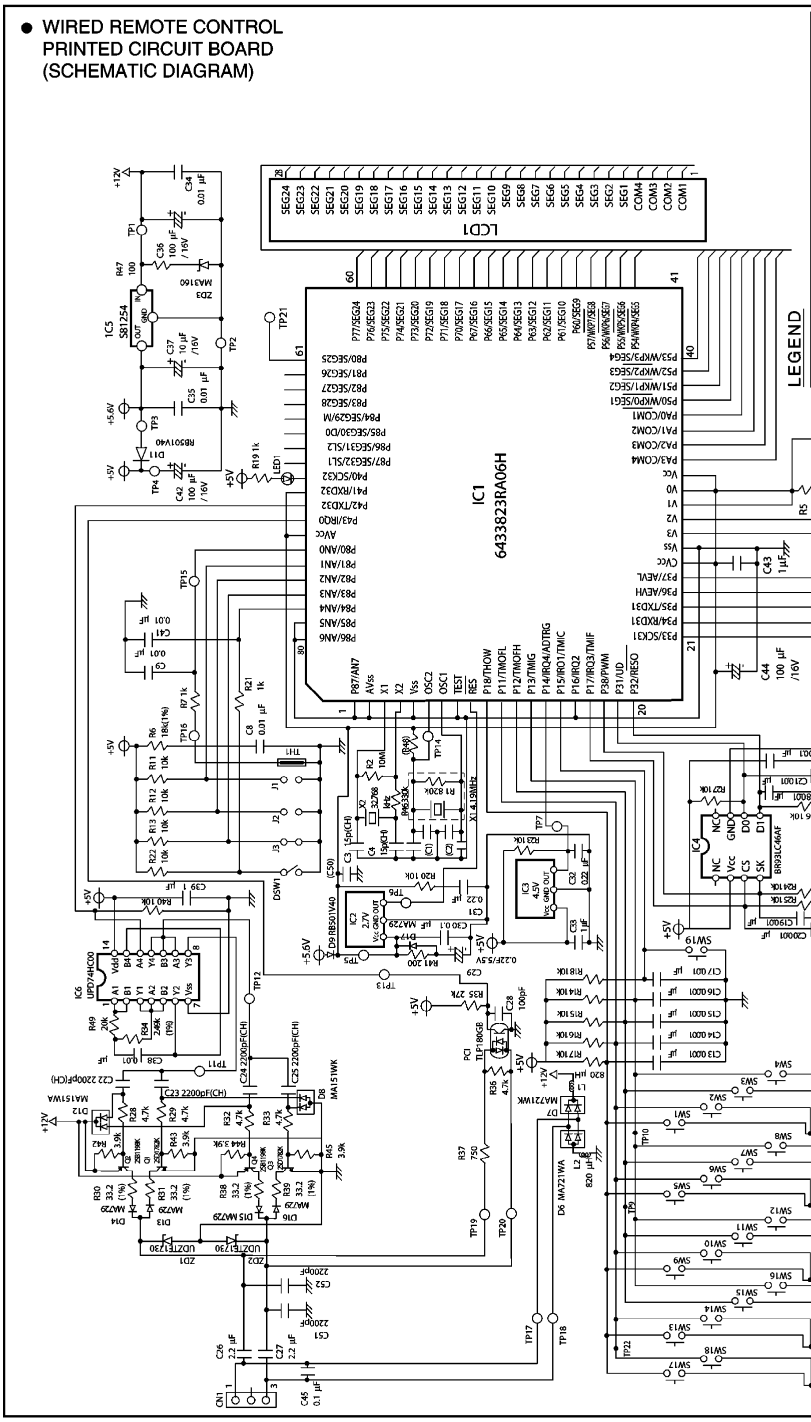

PD70012FCK
IC1
BR93LC46AF
IC3
MM1098б
IC4
EA05FP
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
TM1
AC220V
DB1
SW1
SW2
SW3
SOR-112HS
DSM ES0178200
SSR1
SSR2
SSR11
SSR21
SSR24
DTC114EK
DTC123EK
2SA1037AK
DAN202K
SLM-310
VCC
+12V
53375-0612
53375-1410
53375-0610
53728-0412
53728-0410
53728-0612
3720-0610
53375-0310
53720-0210
5545-16A
CST3CC8.38MG
ML-5001SXF4P

	A742583	A742584	A742585	A742586	A742587	A742588	A742589	A742590
D14	NONE	AVLB	←	←	NONE	AVLB	NONE	←
C26	NONE	AVLB	←	←	NONE	AVLB	NONE	←
C28	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R66	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R68	NONE	AVLB	←	←	NONE	AVLB	NONE	←
R69	NONE	AVLB	←	←	NONE	AVLB	NONE	←
J1	NONE	←	←	AVLB	←	←	←	NONE
J2	AVLB	NONE	←	←	AVLB	NONE	AVLB	←
PC1	NONE	AVLB	←	←	NONE	AVLB	NONE	←
SSR2	NONE	←	AVLB	←	NONE	←	AVLB	←
VA3	NONE	AVLB	←	←	NONE	AVLB	NONE	←
VA5	AVLB	←	←	NONE	←	←	←	AVLB
VA7	NONE	←	AVLB	←	NONE	←	AVLB	←
SSR21	AVLB	←	←	NONE	←	←	←	AVLB

AVLB - Available
NONE - Not available

APPLICABLE FOR ALL MODELS

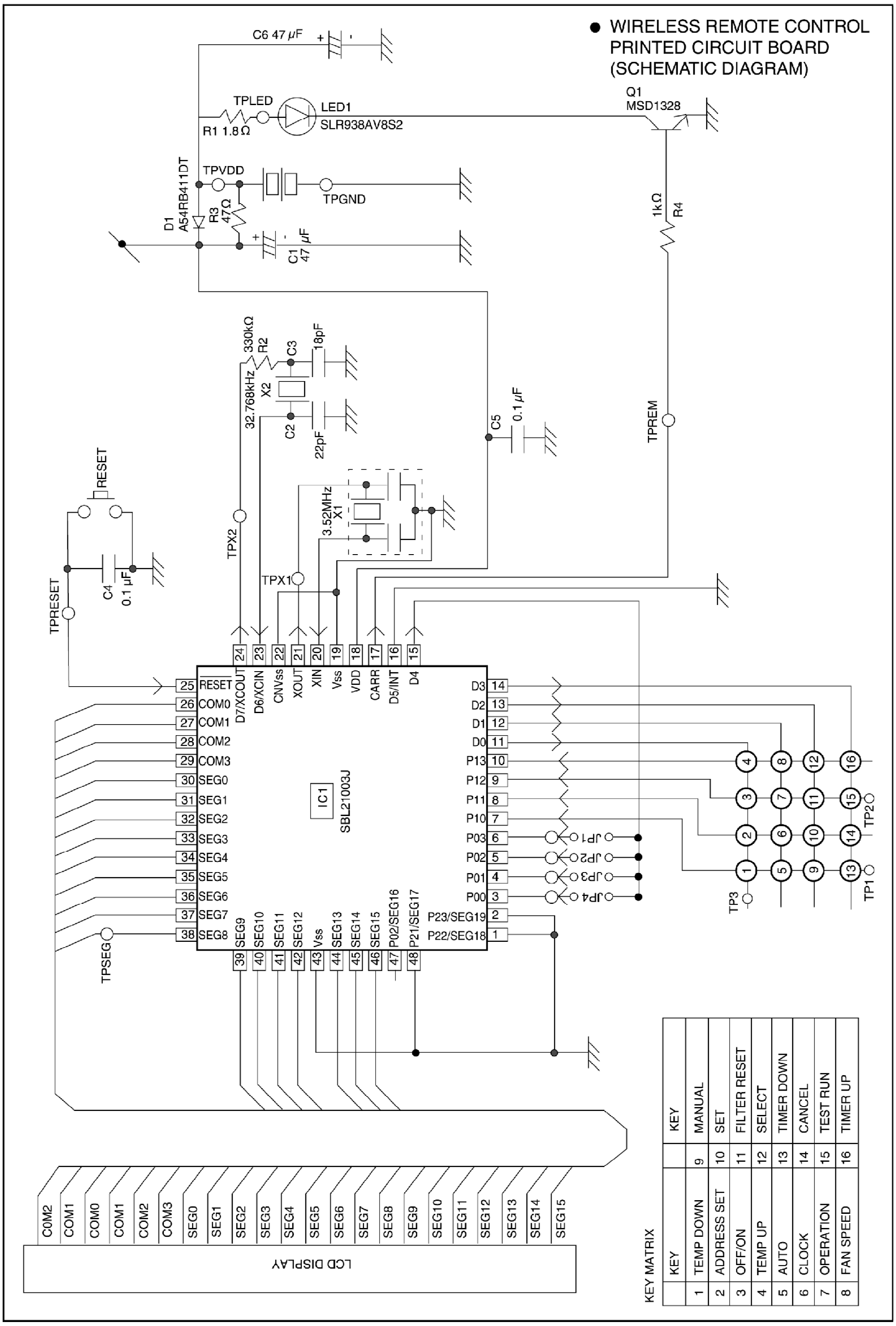
● WIRED REMOTE CONTROL PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)


LCD1
IC1
6433823RA06H
IC2 RB501V40
IC3
IC4 BR93LC46AF
IC5 S81254
IC6 UPD74HC00
PC1 TLP180GB
CN1
DSW1
J1
J2
J3
TH1

LEGEND

J1	———	J3	JUMPER
J2	———	DSW1	TWIN-TRIPPLE SETTING (ON:SAVE, OFF:MAIN)
SW1	FAN SPEED	SW11	CANCEL
SW2	———	SW12	CLOCK
SW3	CHECK	SW13	SET TEMPERATURE UP
SW4	AIR SWING MANUAL	SW14	SET TEMPERATURE DOWN
SW5	OPERATION	SW15	FILTER RESET
SW6	———	SW16	TEST RUN
SW7	AIR CONDITIONER NO.	SW17	▲ (TO SET A LATER TIME)
SW8	AIR SWING AUTO	SW18	▼ (TO SET AN EARLIER TIME)
SW9	SELECT	SW19	OFF / ON
SW10	SET	SW20	———

APPLICABLE FOR ALL MODELS


● WIRELESS REMOTE CONTROL PRINTED CIRCUIT BOARD (SCHEMATIC DIAGRAM)
C6 47 μF
TPLED
LED1
SLR938AV8S2
R1 1.8Ω
Q1
MSD1328
TPVDD
TPGND
D1
A54RB411DT
R3 47Ω
C1 47 μF
1kΩ
R4
330kΩ
R2
C3
18pF
32.768kHz
X2
C2
22pF
C5
0.1 μF
TPREM
RESET
3.52MHz
X1
TPX2
TPX1
TPRESET
C4
0.1 μF
IC1
SBL21003J
RESET
COM0
COM1
COM2
COM3
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
D7/XCOUT
D6/XCIN
CNVss
XOUT
XIN
Vss
VDD
CARR
D5/INT
D4
D3
D2
D1
D0
P13
P12
P11
P10
P03
P02
P01
P00
P23/SEG19
P22/SEG18
SEG9
SEG10
SEG11
SEG12
Vss
SEG13
SEG14
SEG15
P02/SEG16
P21/SEG17
JP1
JP2
JP3
JP4
TP1
TP2
TP3
TPSEG
LCD DISPLAY
COM2
COM1
COM0
COM1
COM2
COM3
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
SEG11
SEG12
SEG13
SEG14
SEG15

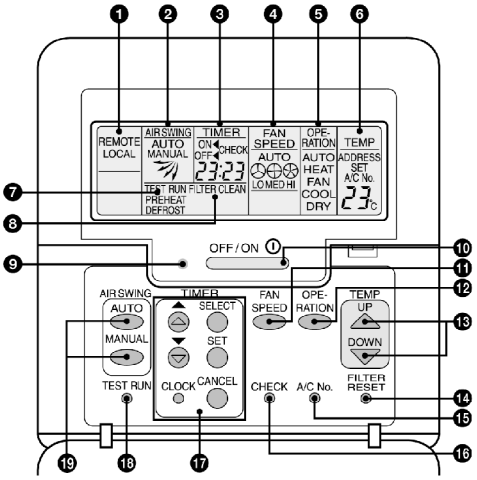
KEY MATRIX

	KEY		KEY
1	TEMP DOWN	9	MANUAL
2	ADDRESS SET	10	SET
3	OFF/ON	11	FILTER RESET
4	TEMP UP	12	SELECT
5	AUTO	13	TIMER DOWN
6	CLOCK	14	CANCEL
7	OPERATION	15	TEST RUN
8	FAN SPEED	16	TIMER UP

7. OPERATING INSTRUCTION

7.1. Wired Remote Control (OPTIONAL PARTS)

Name and function of each part



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REMOTE
LOCAL
AIR SWING
AUTO
MANUAL
TIMER
ON
OFF
CHECK
23:23
FAN SPEED
AUTO
LO MED HI
OPE-RATION
AUTO
HEAT
FAN
COOL
DRY
TEMP
ADDRESS
SET
A/C No.
23°C
TEST RUN
FILTER CLEAN
PREHEAT
DEFROST
OFF / ON
AIR SWING
AUTO
MANUAL
TEST RUN
TIMER
SELECT
SET
CLOCK
CANCEL
FAN SPEED
OPE-RATION
CHECK
A/C No.
TEMP
UP
DOWN
FILTER RESET

① **REMOTE**
The OFF/ON button cannot be used.

LOCAL
All remote control functions can be used.

② **Airflow direction setting display**

③ **Timer/time setting display**

④ **Fan speed display**

⑤ **Operation mode selection display**

⑥ **Temperature setting display (16˚C - 31˚C)**

⑦ **TEST RUN**
Indicates that the unit is running in test operation mode.

PREHEAT
Indicates that the unit is running in pre-heating mode.

DEFROST
Indicates that the unit is running in dedrosting mode.

⑧ **FILTER CLEAN**
(Appears after the cumulative running time reaches approximately 2,500 hours of operation.)

⑨ **Operation indicator**
Lights up in red when the unit is operating.

⑩ **OFF/ON button**
Used to start and stop the operation.

⑪ **FAN SPEED button**
Used to select the fan speed of high (HI), medium (MED), low (LO) or autofan (AUTO).

⑫ **OPERATION button**
Used to select the operation of FAN, COOL, DRY, AUTO or HEAT.

⑬ **TEMP (UP/DOWN) buttons**
Used to select the desired temperature.

⑭ **FILTER RESET button**
Press to reset the "FILTER CLEAN" after washing the filter.

⑮ **A/C No. button***
This switch is used during group control.
It is not needed for normal operation.

⑯ **CHECK button**
Press this button if the check display is flashing.

⑰ **TIMER/CLOCK SET buttons**
Used to set the timer operation and the current time.

⑱ **TEST RUN button***

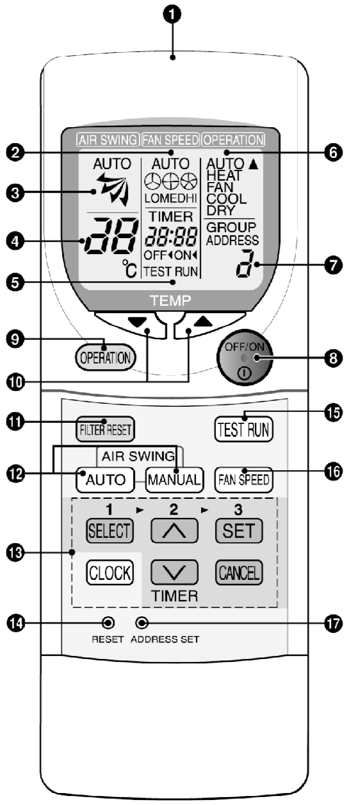
⑲ **AIR SWING (AUTO/MANUAL) buttons**
Used to determine the air swing condition, either auto or manual.

NOTES:

- **Ensure that the correct button is pressed as simultaneous pressing of the multiple buttons will not make the setting correct.**
- **The illustration above is for explanatory purposes only. The appearance will be different during actual operation.**
- **Do not operate the remote control with wet hands. Otherwise, electric shock or malfunction may occur.**
- **Do not press the remote control buttons with sharp object as this may damage the remote control.**
- **Buttons marked with * are not needed for normal operation. If one of these buttons is pressed by mistake, press the same button once more to cancel the operation.**
- **When the power resumed after power failure, the unit will restart automatically with all the previous settings preserved by the memory function. (Auto restart function)**

7.2. Wireless Remote Control (OPTIONAL PARTS)

Name and function of each part



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AIR SWING
FAN SPEED
OPERATION
AUTO
AUTO
AUTO ▲
HEAT
FAN
COOL
DRY
LOMEDHI
TIMER
GROUP
ADDRESS
OFF◂ON◂
°C
TEST RUN
TEMP
OPERATION
OFF/ON
FILTER RESET
TEST RUN
AIR SWING
AUTO
MANUAL
FAN SPEED
1
2
3
SELECT
SET
CLOCK
CANCEL
TIMER
RESET
ADDRESS SET

❶ **Transmitter**
Transmits the remote control signal.

❷ **Fan speed display**

❸ **Airflow direction setting display**

❹ **Temperature setting display (16˚C - 31˚C)**

❺ **Timer/time setting display**
Shows the timer operation setting time or the current time.

❻ **Operation selection display**

❼ **Address number display**

❽ **OFF/ON button**
Used to start and stop the operation.

❾ **OPERATION button**
Used to select the operation of FAN, COOL, DRY, AUTO or HEAT.

❿ **TEMP (UP/DOWN) buttons**
Used to select the desired temperature.

⓫ **FILTER RESET button**
Press to cancel the "FILTER" indicator light on the ray receiver.

⓬ **AIR SWING (AUTO/MANUAL) buttons**
Used to determine the air swing condition, either auto or manual.

⓭ **TIMER/CLOCK SET buttons**
Used to set the timer operation and the current time.

⓮ **RESET button**
Pressing this button will clear all the settings from memory.
You will then need to make the settings again.

⓯ **TEST RUN button***

⓰ **FAN SPEED button**
Used to select the fan speed of high (HI), medium (MED), low (LO) or autofan (AUTO).

⓱ **ADDRESS SET button***
Used to change the address setting when using more than one indoor unit.

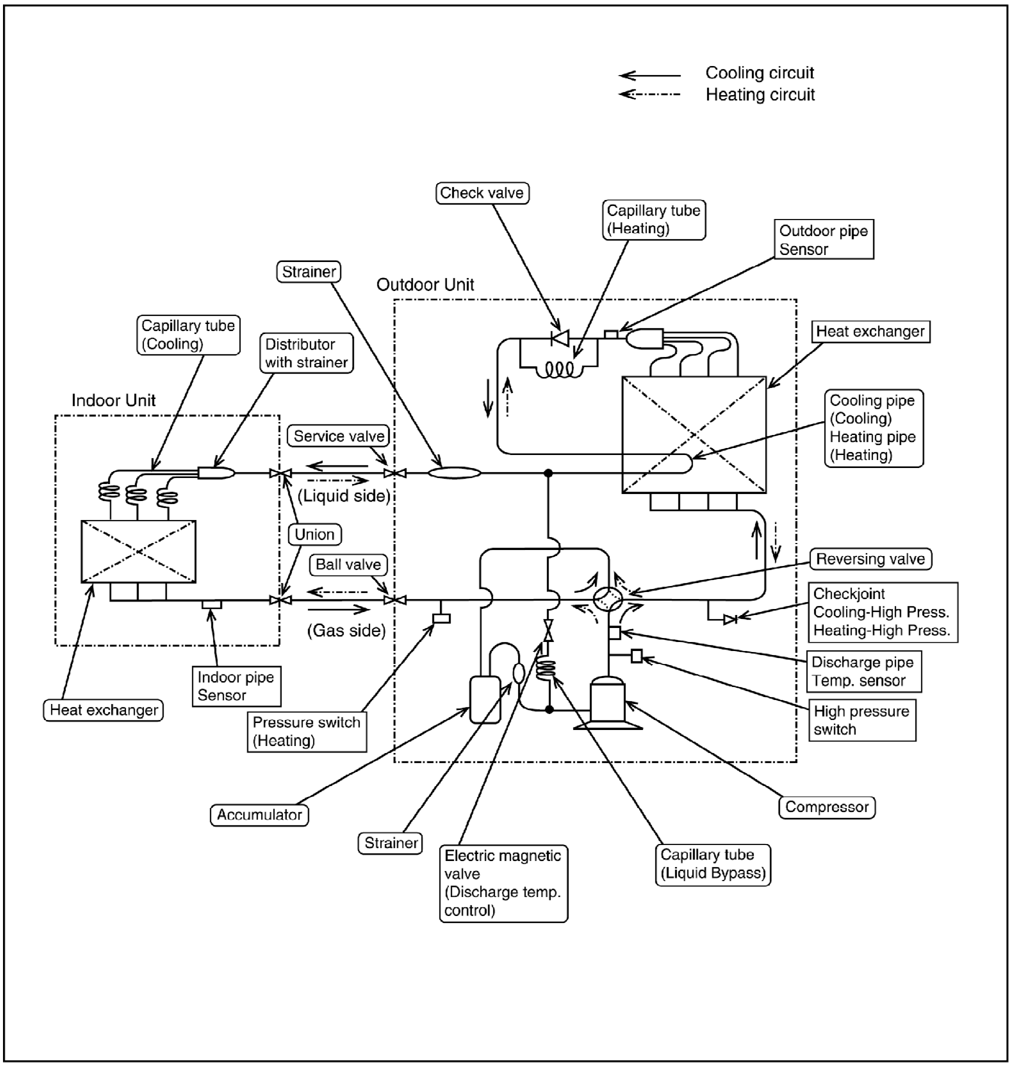
NOTES:

- **Ensure that the correct button is pressed as simultaneous pressing of the multiple buttons will not make the setting correct.**
- **The illustration above is for explanatory purpose only. The appearance will be different during actual operation.**
- **If using the wireless remote control in conjunction with the wired remote control, the settings made from the wireless remote control will appear on the wired remote control display (except when making timer settings).**
- **Buttons marked with * are not needed for normal operation. If one of these buttons is pressed by mistake, press the same button once more to cancel the operation.**
- **When the power resumed after power failure, the unit will restart automatically with all previous settings preserved by the memory**

function. (Auto restart function)

8. REFRIGERATION CYCLE

CS-A24BB4P/CU-A24BBP5, CS-A28BB4P/CU-A28BBP5, CS-A28BB4P/CU-A28BBP8, CS-A34BB4P/CU-A34BBP5, CS-A34BB4P/CU-A34BBP8, CS-A43BB4P/CU-A43BBP8, CS-A50BB4P/CU-A50BBP8


Cooling circuit
Heating circuit
Check valve
Capillary tube (Heating)
Outdoor pipe Sensor
Strainer
Outdoor Unit
Capillary tube (Cooling)
Distributor with strainer
Heat exchanger
Indoor Unit
Cooling pipe (Cooling) Heating pipe (Heating)
Service valve
(Liquid side)
Union
Ball valve
Reversing valve
Checkjoint Cooling-High Press. Heating-High Press.
(Gas side)
Discharge pipe Temp. sensor
Indoor pipe Sensor
High pressure switch
Heat exchanger
Pressure switch (Heating)
Compressor
Accumulator
Strainer
Electric magnetic valve (Discharge temp. control)
Capillary tube (Liquid Bypass)

CS-A24BB4P/CU-C24BBP5, CS-A28BB4P/CU-C28BBP5, CS-A28BB4P/CU-C28BBP6, CS-A28BB4P/CU-C28BBP8, CS-A34BB4P/CU-C34BBP5, CS-A34BB4P/CU-C34BBP7, CS-A34BB4P/CU-C34BBP8, CS-A43BB4P/CU-C43BBP7, CS-A43BB4P/CU-C43BBP8, CS-A50BB4P/CU-C50BBP7, CS-A50BB4P/CU-C50BBP8

9. OPERATION RANGE

Power Supply

The applicable voltage range for each unit is given in the following table. The working voltage among the three phases must be balanced within a 3% deviation from each voltage at the compressor terminals. The starting voltage must be higher than 85% of the rated voltage.

Power Supply

MODEL CU-	Unit Main Power		Applicable Voltage		MODEL CU-	Unit Main Power		Applicable	
	Phase, Volts	Hz	Max	Min		Phase, Volts	Hz	Max	
A24BBP5 A28BBP5 A34BBP5 C24BBP5 C28BBP5 C34BBP5	1~220	50	242	198	A28BBP8 A34BBP8 A43BBP8 A50BBP8 C28BBP8 C34BBP8 C43BBP8 C50BBP8	3N~380	50	418	
	1~230	50	253	207		3N~400	50	440	
	1~240	50	264	216		3N~415	50	457	
C28BBP6	1~220	60	242	198	C34BBP7 C43BBP7 C50BBP7	3~220	60	242	

Indoor and Outdoor Temperature

- Cooling only type / Model 50Hz CU-C24BBP5, CU-C28BBP5, CU-C28BBP8, CU-C34BBP5, CU-C34BBP8, CU-C43BBP8, CU-C50BBP8 Model 60Hz CU-C28BBP6, CU-C34BBP7, CU-C43BBP7, CU-C50BBP7

Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W	
		Max	Min	Max	
Cooling	50/60	32/23	21/15	43/-	

- Heat pump type / Model 50Hz CU-A24BBP5, CU-A28BBP5, CU-A28BBP8, CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8

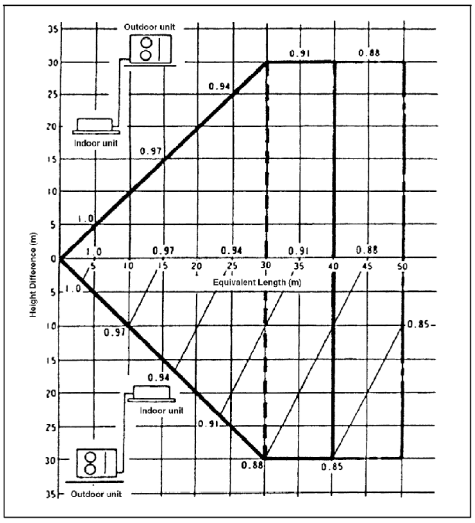
Operating	Hz	Indoor Temp. (D.B./W.B.) (°C)		Outdoor Temp. (D.B./W.B	
		Max	Min	Max	Mi
Cooling	50	32/23	21/15	43/-	-5/
Heating	50	27/-	16/-	24/18	-10

10. PIPE LENGTH

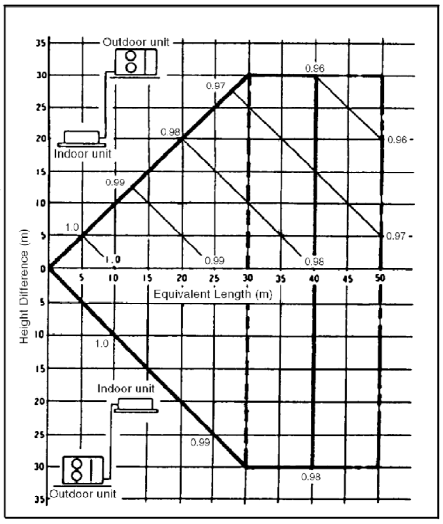
■ **CORRECTION OF COOLING CAPACITY AND HEATING CAPACITIES**

Correction of cooling and heating capacities according to the connecting pipe length. / The data of cooling capacities (marked on the name plate) are based on 5 meters connecting pipe and horizontal installation. / For other pipe length of other installation multiply by the following correction factor to determine the revised cooling capacity.

[Cooling]



[Heating]



1.5HP (14BB4)
2HP (18BB4)
2.5HP ~ 6HP (24BB4 ~ 50BB4)

Equivalent Length = actual pipe length + number of elbow x ELE + number of oil trap x ELO
ELE : equivalent length of elbow
ELO : equivalent length of oil trap

Outer diameter of gas side pipe mm (inch)	ELE
12.7 (1/2)	0.20
15.88 (5/8)	0.25
19.05 (3/4)	0.35

■ REFRIGERANT ADDITIONAL CHARGE

1. Piping installation by standard piping

- At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30m. (Refer to the following table)
But when the piping length exceeds 30m, additional charge is required according to the following table.
Example:
CU-C24BBP5
In case of 30m long pipe (one way), the amount of refrigerant to be replenished is: (40 - 30) x 20 = 200g
CU-C50BBP8
In case of 50m long pipe (one way), the amount of refrigerant

to be replenished is: (50 - 30) x 50 = 1,000g

- **Cooling only type**

Model Name	Standard piping specification			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Additional gas volume (g/m)
CU-C24BBP5	6.35	15.88	30	20
CU-C28BBP5	9.52	15.88	30	50
CU-C28BBP8	9.52	15.88	30	50
CU-C34BBP5	9.52	19.05	30	50
CU-C34BBP8	9.52	19.05	30	50
CU-C43BBP8	9.52	19.05	30	50
CU-C50BBP8	9.52	19.05	30	50
CU-C28BBP6	9.52	15.88	30	50
CU-C34BBP7	9.52	19.05	30	50
CU-C43BBP7	9.52	19.05	30	50
CU-C50BBP7	9.52	19.05	30	50

Model Name	Existing piping specification (Larger piping)			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Addition gas volume (g/m)
CU-C24BBP5	9.52	15.88	3	50
CU-C28BBP5	12.7	15.88	7	100
CU-C28BBP8	12.7	15.88	7	100
CU-C34BBP5	12.7	19.05	7	100
CU-C34BBP8	12.7	19.05	7	100
CU-C43BBP8	12.7	19.05	7	100
CU-C50BBP8	12.7	19.05	7	100
CU-C28BBP6	12.7	15.88	17	100
CU-C34BBP7	12.7	19.05	17	100
CU-C43BBP7	12.7	19.05	17	100
CU-C50BBP7	12.7	19.05	17	100

■ Heat pump type

Model Name	Standard piping specification			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Additional gas volume (g/m)
CU-A24BBP5	6.35	15.88	30	20
CU-A28BBP5	9.52	15.88	30	50
CU-A28BBP8	9.52	15.88	30	50
CU-A34BBP5	9.52	19.05	30	50
CU-A34BBP8	9.52	19.05	30	50
CU-A43BBP8	9.52	19.05	30	50
CU-A50BBP8	9.52	19.05	30	50

Model Name	Existing piping specification (Larger piping)			
	Liquid piping (dia.mm)	Gas piping (dia.mm)	Gas charge-less length (m)	Addition gas volume (g/m)
CU-A24BBP5	9.52	15.88	13	50
CU-A28BBP5	12.7	15.88	17	100
CU-A28BBP8	12.7	15.88	17	100
CU-A34BBP5	12.7	19.05	17	100
CU-A34BBP8	12.7	19.05	17	100
CU-A43BBP8	12.7	19.05	17	100
CU-A50BBP8	12.7	19.05	17	100

2. Piping installation by existing piping

The above models change the liquid pipe size of the previous

series. It is to use the existing piping by adjusting the refrigerant gas volume.

Please do correct piping installation referring to the above table.

⚠ Attention

- **Please do not decrease the gas piping size. (It causes the breakdown of the compressor).**
- **The equivalent piping length and the cooling and heating capacity change rate are same as the standard piping specification.**

11. OPERATING CHARACTERISTIC

Model		Main Power Source		Compressor Motor			Indoor Unit Fan Motor		Outd Far
		Voltage	Frequency	S.C.	R.C. (A)	IPT (kW)	R.C.	IPT	R.C.
		(V)	(Hz)	(A)	Cool/Heat	Cool/ Heat	(A)	(kW)	(A)
COOLING ONLY MODEL	CS-A24BB4P	220	50	49	10.6	2.31	0.40	0.08	0.50
	CU-C24BBP5	230	50	51	10.2	2.31	0.40	0.08	0.50
		240	50	52	9.8	2.31	0.40	0.08	0.50
	CS-A28BB4P	220	50	50	11.35	2.49	0.45	0.09	0.50
	CU-C28BBP5	230	50	52	11.05	2.49	0.45	0.09	0.50
		240	50	54	10.75	2.49	0.45	0.09	0.50
	CS-A28BB4P	380	50	28	4.08	2.49	0.45	0.09	0.50
	CU-C28BBP8	400	50	29	4.03	2.49	0.45	0.09	0.50
		415	50	30	3.98	2.49	0.45	0.09	0.50
	CS-A28BB4P								
	CU-C28BBP6	220	60	70	14.35	3.00	0.45	0.09	0.50
	CS-A34BB4P	220	50	94	15.3	3.23	0.70	0.15	1.00
	CU-C34BBP5	230	50	99	15.4	3.23	0.70	0.15	1.00
		240	50	103	15.5	3.23	0.70	0.15	1.00
	CS-A34BB4P	380	50	39	5.13	2.93	0.70	0.15	1.00
	CU-C34BBP8	400	50	41	5.13	2.93	0.70	0.15	1.00
		415	50	42	5.13	2.93	0.70	0.15	1.00
	CS-A34BB4P								
	CU-C34BBP7	220	60	86	10.30	3.73	0.70	0.15	1.00
	CS-A43BB4P	380	50	58	6.63	3.82	0.90	0.20	1.10
	CU-C43BBP8	400	50	58	6.63	3.82	0.90	0.20	1.10

		415	50	58	6.63	3.82	0.90	0.20	1.10
	CS-A43BB4P CU-C43BBP7	220	60	103	13.00	4.67	0.90	0.20	1.10
	CS-A50BB4P	380	50	69	7.90	4.54	0.90	0.20	1.20
	CU-C50BBP8	400	50	69	7.90	4.54	0.90	0.20	1.20
		415	50	69	7.90	4.54	0.90	0.20	1.20
	CS-A50BBP CU-C50BBP7	220	60	149	15.60	5.55	0.90	0.20	1.20

Model		Main Power Source		Compressor Motor			Indoor Unit Fan Motor		Outd Fan
		Voltage (V)	Frequency (Hz)	S.C. (A)	R.C. (A) Cool/Heat	IPT (kW) Cool/ Heat	R.C. (A)	IPT (kW)	R.C. (A)
	CS-A24BB4P	220	50	49	10.6 / 10.5	2.31 / 2.30	0.40	0.08	0.50
	CU-A24BBP5	230	50	51	10.2 / 10.1	2.31 / 2.30	0.40	0.08	0.50
		240	50	52	9.8 / 9.8	2.31 / 2.30	0.40	0.08	0.50
	CS-A28BB4P	220	50	50	11.35 / 11.05	2.49 / 2.41	0.45	0.09	0.50
H	CU-A28BBP5	230	50	52	11.05 / 10.75	2.49 / 2.41	0.45	0.09	0.50
E		240	50	54	10.75 / 10.45	2.49 / 2.41	0.45	0.09	0.50
A	CS-A28BB4P	380	50	28	4.18 / 3.98	2.49 / 2.41	0.45	0.09	0.50
T	CU-A28BBP8	400	50	29	4.13 / 3.93	2.49 / 2.41	0.45	0.09	0.50
		415	50	30	4.08 / 3.88	2.49 / 2.41	0.45	0.09	0.50
P	CS-A34BB4P	220	50	94	15.3 / 15.1	3.23 / 3.18	0.70	0.15	1.00
U	CU-A34BBP5	230	50	99	15.4 / 15.2	3.23 / 3.18	0.70	0.15	1.00
M		240	50	103	15.5 / 15.3	3.23 / 3.18	0.70	0.15	1.00
P	CS-A34BB4P	380	50	39	5.13 / 5.23	2.93 / 3.03	0.70	0.15	1.00
	CU-A34BBP8	400	50	41	5.13 / 5.23	2.93 / 3.03	0.70	0.15	1.00

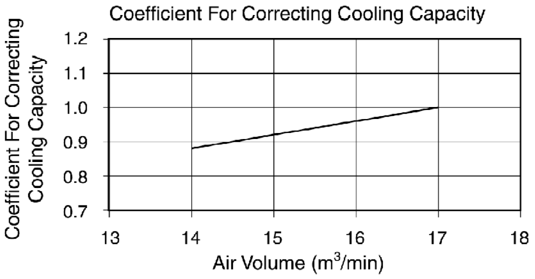
M		415	50	42	5.13 / 5.23	2.93 / 3.03	0.70	0.15	1.00
O	CS-A43BB4P	380	50	58	6.63 / 6.33	3.82 / 3.67	0.90	0.20	1.10
D	CU-A43BBP8	400	50	58	6.63 / 6.33	3.82 / 3.67	0.90	0.20	1.10
E		415	50	58	6.63 / 6.33	3.82 / 3.67	0.90	0.20	1.10
L	CS-A50BB4P	380	50	69	7.90 / 7.80	4.54 / 4.52	0.90	0.20	1.20
	CU-A50BBP8	400	50	69	7.90 / 7.80	4.56 / 4.54	0.90	0.18	1.20
		415	50	69	7.90 / 7.80	4.54 / 4.52	0.90	0.20	1.20

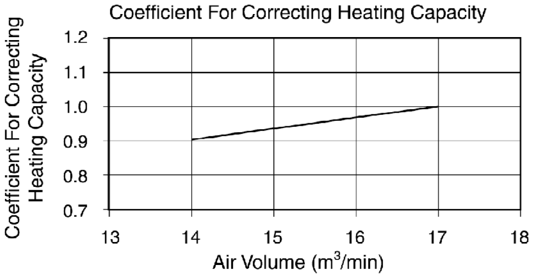
Legend : S.C. = Starting Current, R.C. = Running Current, IPT = Power Consumption

12. FAN PERFORMANCE

CS-A24BB4P

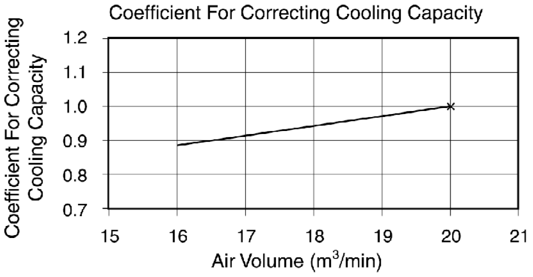
ITEM / MODEL		Indoor Unit			Outdoor Unit
		CS-A24BB4P			CU-A24BBP5, CU-C24BBP5
MODE		Hi	Me	Lo	Hi
Air Volume	m3/ min	17	15	14	43
Running Current	A	0.38	0.31	0.27	0.50
Power Consumption	kW	0.08	0.07	0.06	0.11
Fan Speed	r/min	425	385	335	660

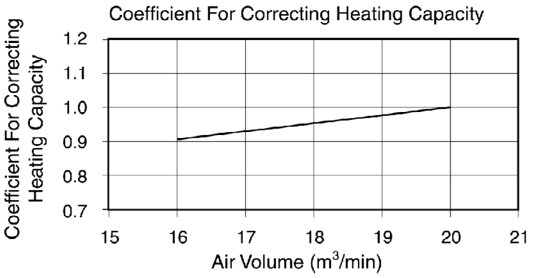




CS-A28BB4P

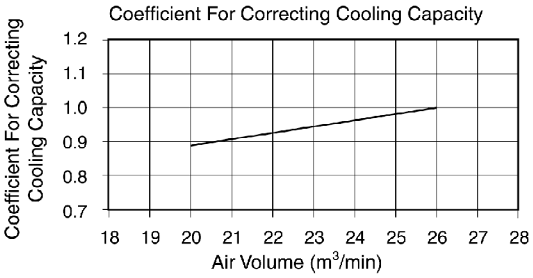
ITEM / MODEL		Indoor Unit			Outdoor Unit
		CS-A28BB4P			CU-A28BBP5, CU-A28BBP8, CU-C28BBP5, CU-C28BBP6, CU-C28BBP8
MODE		Hi	Me	Lo	Hi
Air Volume	m3/min	20	18	16	43
Running Current	A	0.42	0.36	0.31	0.50
Power Consumption	kW	0.09	0.08	0.07	0.11
Fan Speed	r/min	470	425	370	660

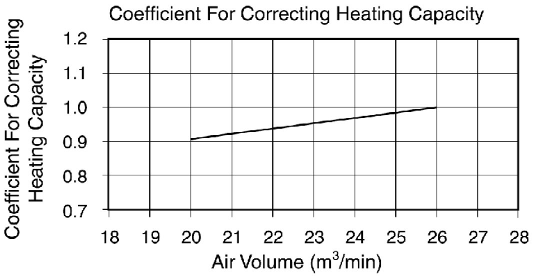




CS-A34BB4P

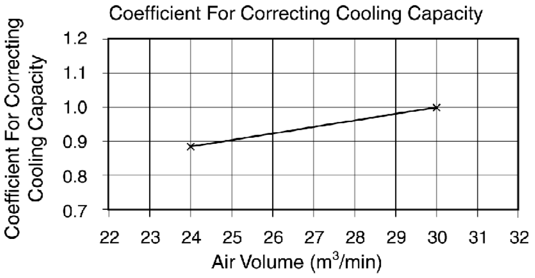
ITEM / MODEL		Indoor Unit			Outdoor Unit
		CS-A34B4P			CU-A34BBP5, CU-A34BBP8, CU-C34BBP5, CU-C34BBP7, CU-C34BBP8
MODE		Hi	Me	Lo	Hi
Air Volume	m3/min	26	23	20	70
Running Current	A	0.70	0.60	0.50	1.00
Power Consumption	kW	0.15	0.12	0.10	0.22
Fan Speed	r/min	565	500	425	670

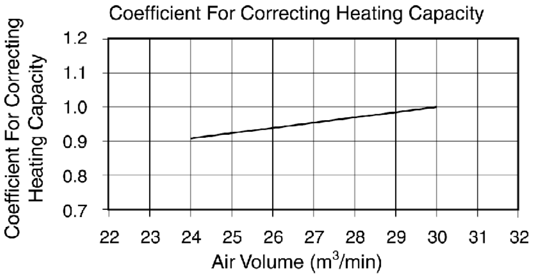




CS-A43BB4P

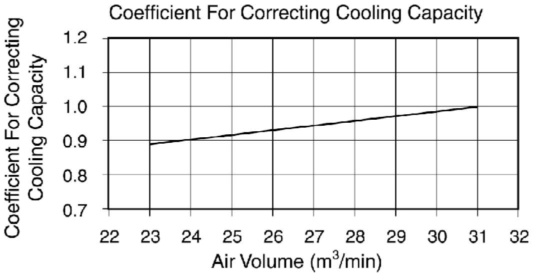
ITEM / MODEL		Indoor Unit			Outdoor Unit
		CS-A43B4P			CU-A43BBP5, CU-C43BBP7, CU-C34BBP8
MODE		**Hi**	**Me**	**Lo**	**Hi**
Air Volume	**m3/ min**	**30**	**27**	**24**	**82**
Running Current	**A**	**0.90**	**0.80**	**0.70**	**1.10**
Power Consumption	**kW**	**0.20**	**0.17**	**0.14**	**0.23**
Fan Speed	**r/min**	**725**	**655**	**575**	**660**

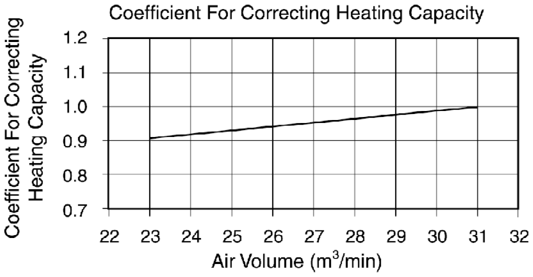




CS-A50BB4P

ITEM / MODEL		Indoor Unit			Outdoor Unit
		CS-A50B4P			CU-A50BBP8, CU-C50BBP7, CU-C50BBP8
MODE		Hi	Me	Lo	Hi
Air Volume	m3/min	30	27	24	86
Running Current	A	0.90	0.80	0.70	1.20
Power Consumption	kW	0.20	0.17	0.14	0.25
Fan Speed	r/min	725	655	575	700


Coefficient For Correcting Cooling Capacity


Coefficient For Correcting Heating Capacity

13. SAFETY DEVICE

INDOOR UNIT

Indoor unit	Heat pump model Cooling only model		CS-A24BB4P	CS-A28BB4P	CS-A34BB4P	CS-A43BB4P	CS
For Fan Motor Protection, Internal Protector (49F)	OFF	°C	135	135	135	135	
	ON	°C	85	85	85	85	
For Control Protection, Fuse	CUT	A	3.15	3.15	3.15	3.15	

OUTDOOR UNIT

Outdoor Unit								
	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8
	Cooling only model	50Hz	CU-C24BBP5	CU-C28BBP5	CU-C28BBP8	CU-C34BBP5	CU-C34BBP8	CU-C43BBP8
		60Hz		CU-C28BBP6	-	-	CU-C34BBP7	CU-C43BBP7
For Refrigerant Cycle, High Pressure Switch (63H$_1$)	OFF	MPa	2.94	2.94	2.94	2.94	2.94	2.94
	ON	MPa	2.84	2.84	2.84	2.84	2.84	2.84
For Compressor Over Current Protection	OFF (Heat pump)	A	19	20	9	28	10	11
	OFF (Cooling only)	A 50Hz	19	20	9	28	10	11
		A 60Hz	24	25	_	–	19	26
	RESET	-	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Discharge Temp. Protection, Discharge Temp. Thermistor (Th1)	Compressor OFF	°C	115	115	115	120	120	120

Liquid Compression Protection, Crankcase Heater	**Input power**	**W**	**31-37**	**31-37**	**31-37**	**31-37**	**31-37**	**34-41**
Compressor Protection, Internal Protector	**OFF**	**°C 50Hz**	**160**	**165**	**120***	**115**	**135**	**120**
		°C 60Hz	**165**	**165**	**-**	**-**	**140**	**135**
	ON	**°C 50Hz**	**90**	**102**	**90***	**61**	**61**	**61**
		°C 60Hz	**105**	**105**	**-**	**-**	**61**	**61**
	Trip time	**50Hz**	**5-15sec/ 55A**	**5-15sec/ 55A**	**-**	**10sec/44A**	**10sec/40A**	**10sec/40A**
		60Hz	**3-9sec/ 96A**	**3-9sec/ 96A**	**-**	**-**	**10sec/85A**	**10sec/85A**
For Fan Motor Protection, Internal Protector (49F)	**OFF**	**°C**	**135**	**135**	**135**	**135**	**135**	**135**
	ON	**°C**	**85**	**85**	**85**	**85**	**85**	**85**
Heating Pressure Switch (Heat Pump Only) (Fan Speed) (63H$_2$)	**OFF**	**MPa**	**2.35**	**2.35**	**2.35**	**2.35**	**2.35**	**2.35**
	ON	**MPa**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Cooling Control, Heat Exchanger Outlet Temp. Thermistor (Th2)	**Control method**	**Th ≥ 30 degree celcius ----- High speed** **Th < 30 degree celcius ------5 speed step control**						
For Control Protection, Fuse	**CUT**	**A**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**

1MPa = 10.2 kgf/cm^2 / * Head Thermostat only for CU-A28BBP8 / CU-C28BBP8

14. COMPONENT SPECIFICATION

Compressor

Model	Heat pump model	50Hz	CU-A24BBP5	CU-A28BBP5 CU-A28BBP8	CU-A34BBP5 CU-A34BBP8		CU-A43BBP8
	Cooling only model	50Hz	CU-C24BBP5	CU-C28BBP5 CU-C28BBP8	CU-C34BBP5 CU-C34BBP8		CU-C43BBP8
		60Hz		CU-C28BBP6		CU-C34BBP7	CU-C43BBP7
Compressor Model		50Hz	NH41VNDT	NH44VNDT NH44YDET	ZR47K3-PFJ ZR45KC-TFD		ZR57KC-TFD
		60Hz		NH44NADT		ZR45KC-TF5	ZR57KC-TF5
Compressor Type (No. of Cylinders)			ROTARY		SCROLL		
			1	1	1	1	1
Revolution		r/min	2,900	2,900	2,900	2,900	2,900
Piston Diplacement		m3/h	7.27	7.73	10.73	11.16	13.42
Motor Type	Starting Method		Direct on-line Starting				
	Rated Output	kW	1.9	2.0	2.8	2.9	3.5
	Poles		2	2	2	2	2
	Insulation Class		E	E	E	E	E
Oil	Type		MS32	MS32	Sontex200LT	Sontex200LT	Sontex200LT
	Charge	L	1.3	1.3	1.2	1.2	2.1

Evaporator

	Models		CS-A24BB4P	CS-A28BB4P	CS-A34BB4P	CS-A43BB4P	A
	Tube Material		Copper tube				
	Outer Diameter	mm	7.0	7.0	7.0	7.0	
	Thickness	mm	0.27	0.27	0.27	0.27	
	Row		2	2	2	3	
	No. of Tubes/Row		8	8	12	12	
	Fin Material		Aluminium				
	Thickness	mm	0.105	0.105	0.105	0.105	
	Fin Pitch	NO./ inch	17	17	19	19	
	Fin Surface		Z Slit fin	Z Slit fin	Z Slit fin	Z Slit fin	Z
	Total Face Area	m2	0.304	0.304	0.456	0.464	
Fan	Type		Turbo fan				
	No. of /Unit		1	1	1	1	
Fan Motor	Starting Method		Direct on-line Starting				
	Rated Output	kW	0.03	0.03	0.05	0.095	
	Poles		6	6	6	6	
	Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	
	Insulation Class		E	E	E	E	

Condenser

Models	Heat pump model		CU-A24BBP5	CU-A28BBP5 CU-A28BBP8	CU-A34BBP5 CU-A34BBP8		CU-A43BBP8	
	Cooling only model		CU-C24BBP5	CU-C28BBP5 CU-C28BBP8 CU-C28BBP6	CU-C34BBP5 CU-C34BBP8	CU-C34BBP7	CU-C43BBP8 CU-C43BBP7	

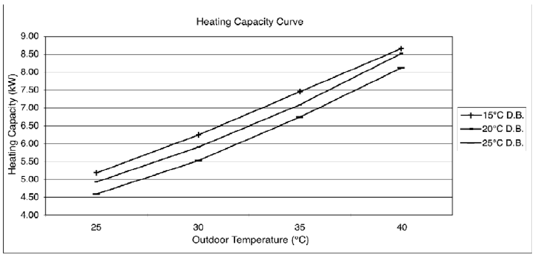
	Tube Material		Copper tube				
	Outer Diameter	mm	9.52	9.52	9.52	9.52	
	Thickness	mm	0.3	0.3	0.3	0.3	
	Row		2	2	2	2	
	No. of Tubes/Row		34	34	46	46	
	Fin Material		Aluminium				
	Thickness	mm	0.105	0.105	0.105	0.105	
	Fin Pitch	NO./ inch	14	14	14	14	
	Fin Surface		AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	AX-Louvre fin	A
	Total Face Area	m^2	0.61	0.61	0.82	1.05	
Fan	Type		Propeller Fan				
	No.of /Unit		1	1	2	2	
Fan Motor	Starting Method		Direct on-line Starting				
	Rated Output	kW	0.05	0.05	0.05 x 2	0.05 x 2	
	Poles		6	6	6	6	
	Phase		Single-Phase	Single-Phase	Single-Phase	Single-Phase	
	Insulation Class		E	E	E	E	

15. CAPACITY AND POWER CONSUMPTION

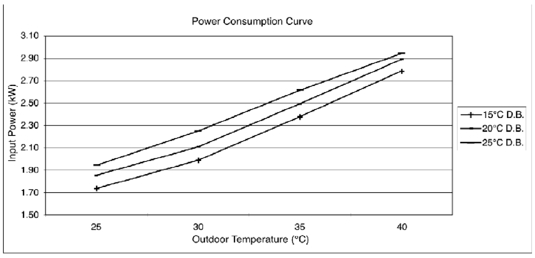
15.1. HEATING PERFORMANCE

Model	Heating capacities are based on conditions below.
CS-A24BB4P Heating capacity 7.1 kW	1 phase, 50Hz, 230V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume $17 m^3$/min

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
17	15	5.18	6.21	7.46	8.66
	20	4.90	5.86	7.10	8.52
	25	4.62	5.54	6.75	8.17

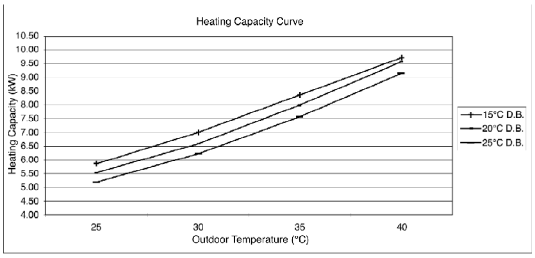


Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
17	15	1.74	1.99	2.37	2.79
	20	1.84	2.12	2.49	2.89
	25	1.94	2.24	2.61	2.95

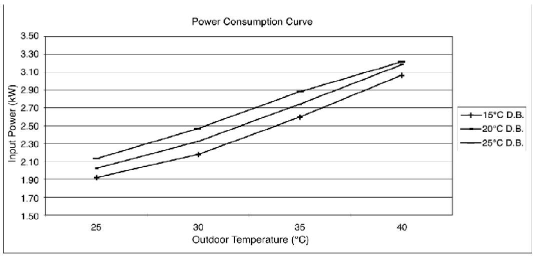


Model	Heating capacities are based on conditions below.
CS-A28BB4P Heating capacity 8.0 kW	1 phase, 50Hz, 230V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume 18m3/min

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
18	15	5.84	7.00	8.40	9.76
	20	5.52	6.60	8.00	9.60
	25	5.20	6.24	7.60	9.20



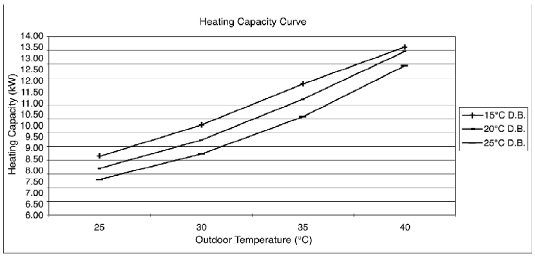
Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
18	15	1.92	2.19	2.60	3.07
	20	2.03	2.33	2.74	3.18
	25	2.14	2.47	2.88	3.22



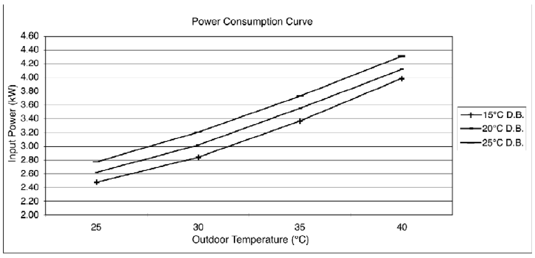
H.C. = Heating Capacity
IPT = Power Consumption

Model	Heating capacities are based on conditions below.
CS-A34BB4P Heating capacity 11.2 kW	**1 phase, 50Hz, 230V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume 27m3/min**

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
27	15	8.18	9.80	11.8	13.7
	20	7.73	9.24	11.2	13.4
	25	7.28	8.74	10.6	12.9

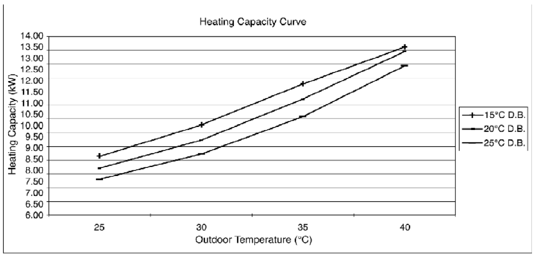


Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
27	15	2.49	2.84	3.37	3.98
	20	2.63	3.02	3.55	4.12
	25	2.77	3.20	3.73	4.30

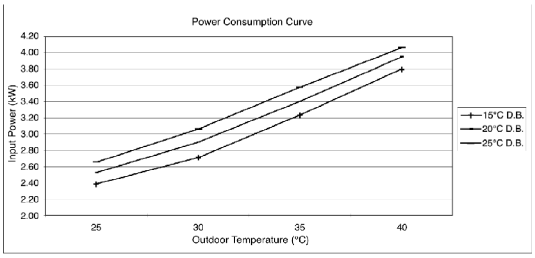


Model	Heating capacities are based on conditions below.
CS-A34BB4P Heating capacity 11.2 kW	3 phase, 50Hz, 400V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume 27m3/min

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
27	15	8.18	9.80	11.8	13.7
	20	7.73	9.24	11.2	13.4
	25	7.28	8.74	10.6	12.9



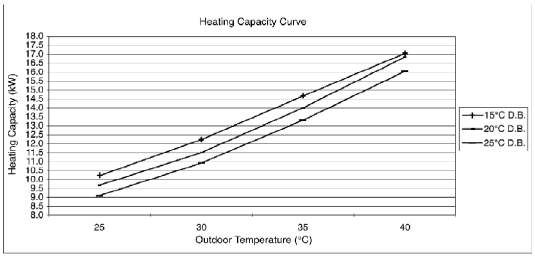
Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m^3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
27	15	2.38	2.72	3.23	3.81
	20	2.52	2.89	3.40	3.94
	25	2.65	3.06	3.57	4.07



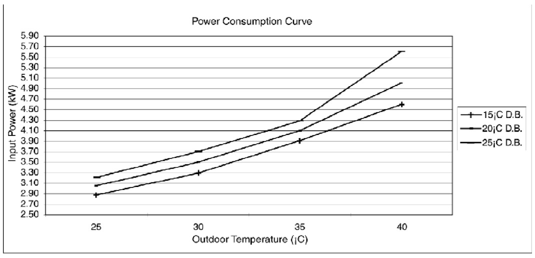
H.C. = Heating Capacity
IPT = Power Consumption

Model	Heating capacities are based on conditions below.
CS-A43BB4P Heating capacity 14.0 kW	3 phase, 50Hz, 400V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume 30m^3/min

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
30	15	10.2	12.3	14.7	17.1
	20	9.66	11.6	14.0	16.8
	25	9.10	110.9	13.3	16.1

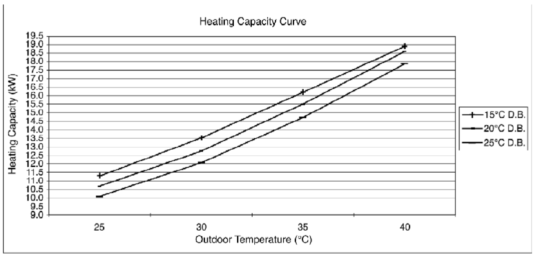


Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/ min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
30	15	2.87	3.28	3.90	4.59
	20	3.03	3.49	4.10	5.00
	25	3.20	3.69	4.31	5.60

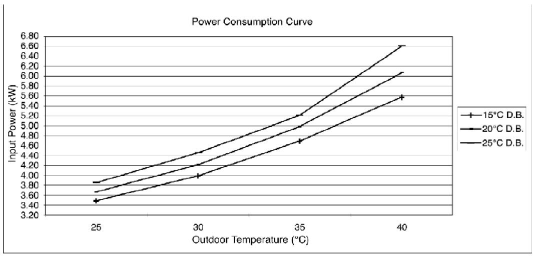


Model	Heating capacities are based on conditions below.
CS-A50BB4P Heating capacity 15.5 kW	3 phase, 50Hz, 400V / Indoor temperature 20°C D.B. / Outdoor temperature 7°C D.B. 6°C W.B. / Standard air volume 31m3/min

Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		H.C.	H.C.	H.C.	H.C.
31	15	11.3	13.6	16.3	18.9
	20	10.7	12.8	15.5	18.6
	25	10.08	12.1	14.7	17.8



Inlet Air		Outdoor Temperature (°C W.B.)			
External Static Pressure (Pa) Air Volume (m3/min)	Entering Air Dry Bulb (°C)	-6	0	6	12
		IPT	IPT	IPT	IPT
31	15	3.48	3.98	4.72	5.57
	20	3.68	4.22	4.97	6.06
	25	3.88	4.47	5.22	6.60

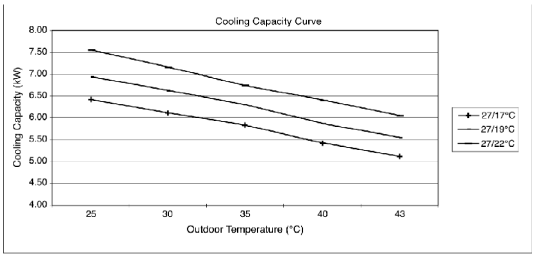


H.C. = Heating Capacity
IPT = Power Consumption

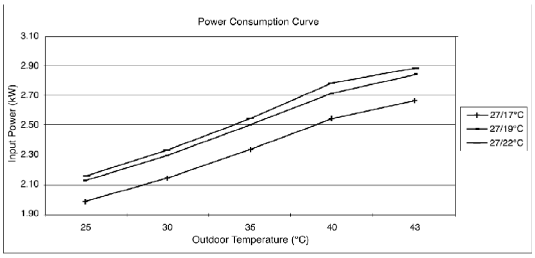
15.2. COOLING PERFORMANCE

Model	Cooling capacities are based on conditions below.
CS-A24BB4P Cooling capacity 6.3 kW	1 phase, 50Hz, 230V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 17m3/min

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		TC	TC	TC	TC	TC
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	6.40	6.10	5.81	5.40	5.11
	19	6.94	6.62	6.30	5.86	5.54
	22	7.55	7.14	6.74	6.39	6.04

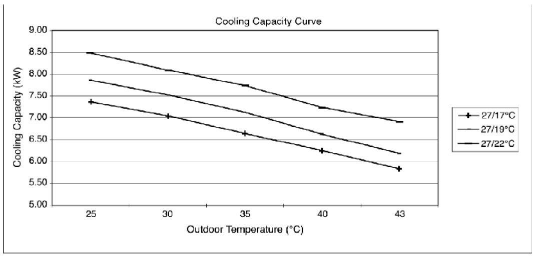


Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		IPT	IPT	IPT	IPT	IPT
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	2.00	2.15	2.234	2.54	2.64
	19	2.13	2.30	2.50	2.72	2.83
	22	2.16	2.33	2.54	2.75	2.87

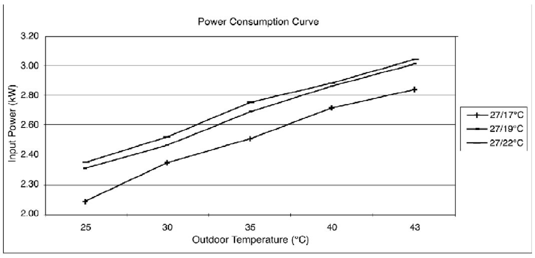


Model	Cooling capacities are based on conditions below.
CS-A28BB4P Cooling capacity 7.1 kW	1 phase, 50Hz, 230V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 18m3/min

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		TC	TC	TC	TC	TC
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	7.35	7.04	6.67	6.21	5.81
	19	7.82	7.53	7.10	6.60	6.18
	22	8.51	8.13	7.70	7.23	6.84



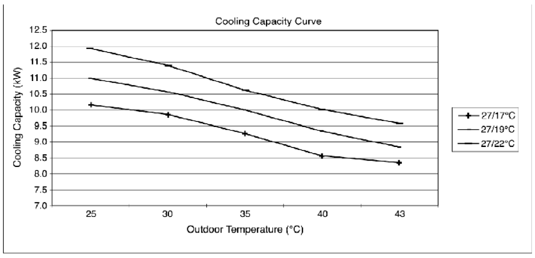
Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		IPT	IPT	IPT	IPT	IPT
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	2.15	2.35	2.52	2.71	2.83
	19	2.29	2.47	2.69	2.85	3.01
	22	2.34	2.52	2.74	2.88	3.04



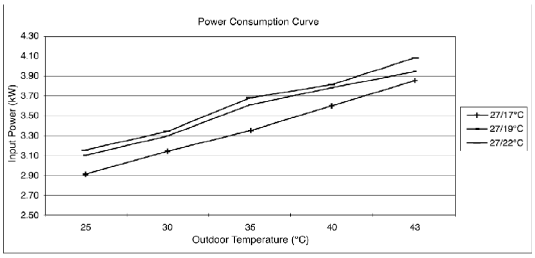
TC = Total Cooling Capacity
IPT = Power Consumption

Model	Cooling capacities are based on conditions below.
CS-A34BB4P Cooling capacity 10.0 kW	1 phase, 50Hz, 230V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 27m3/min

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		TC	TC	TC	TC	TC
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	10.2	9.8	9.22	8.56	8.27
	19	11.0	10.6	10.0	9.30	8.80
	22	11.9	11.3	10.7	10.04	9.59

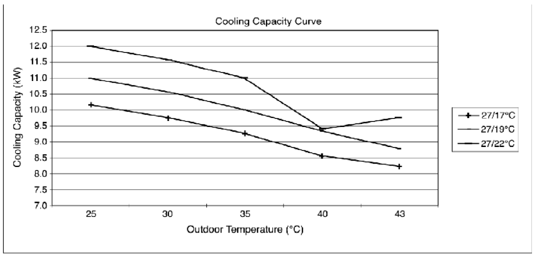


Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		IPT	IPT	IPT	IPT	IPT
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	2.92	3.14	3.37	3.59	3.84
	19	3.07	3.31	3.60	3.78	3.96
	22	3.16	3.37	3.67	3.82	4.08

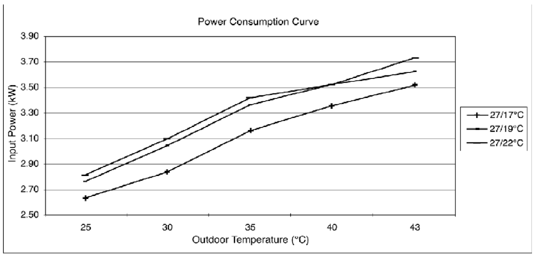


Model	Cooling capacities are based on conditions below.
CS-A34BB4P Cooling capacity 10.0 kW	3 phase, 50Hz, 400V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 27m3/min

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		TC	TC	TC	TC	TC
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	10.2	9.8	9.22	8.57	8.11
	19	11.0	10.6	10.0	9.30	8.80
	22	12.0	11.6	11.0	9.42	9.75



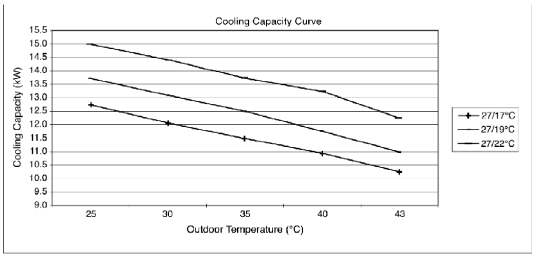
Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		IPT	IPT	IPT	IPT	IPT
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	2.63	2.84	3.09	3.35	3.52
	19	2.77	3.03	3.30	3.53	3.63
	22	2.83	3.09	3.37	3.53	3.74



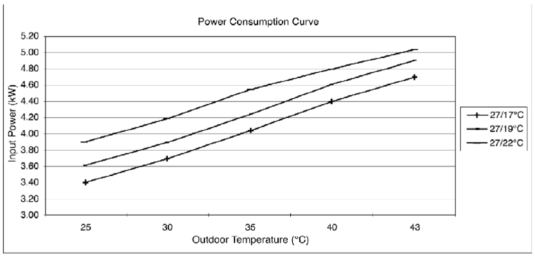
TC = Total Cooling Capacity
IPT = Power Consumption

Model	**Cooling capacities are based on conditions below.**
CS-A43BB4P Cooling capacity 12.5 kW	**3 phase, 50Hz, 400V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 30m3/min**

Entering Air Temperature		**Temperature Air Entering Condenser (°C D.B.)**				
		25	**30**	**35**	**40**	**43**
		TC	**TC**	**TC**	**TC**	**TC**
D.B.	**W.B.**	**kW**	**kW**	**kW**	**kW**	**kW**
27	**17**	**12.7**	**12.1**	**11.5**	**10.9**	**10.2**
	19	**13.8**	**13.1**	**12.5**	**11.8**	**11.0**
	22	**15.0**	**14.3**	**13.7**	**13.2**	**12.2**

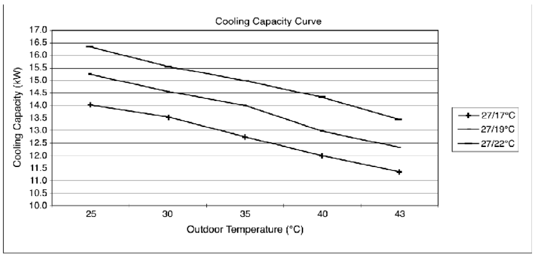


Entering Air Temperature		**Temperature Air Entering Condenser (°C D.B.)**				
		25	**30**	**35**	**40**	**43**
		IPT	**IPT**	**IPT**	**IPT**	**IPT**
D.B.	**W.B.**	**kW**	**kW**	**kW**	**kW**	**kW**
27	**17**	**3.39**	**3.71**	**4.04**	**4.39**	**4.70**
	19	**3.63**	**3.91**	**4.25**	**4.62**	**4.90**
	22	**3.88**	**4.18**	**4.55**	**4.80**	**5.04**

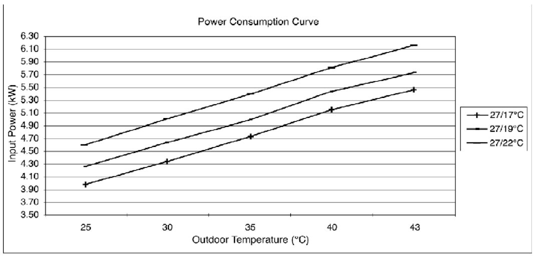


Model	Cooling capacities are based on conditions below.
CS-A50BB4P Cooling capacity 14.0 kW	3 phase, 50Hz, 400V / Indoor temperature 27°C D.B. 19°C W.B. / Outdoor temperature 35°C D.B. / Standard air volume 31m3/min

Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		TC	TC	TC	TC	TC
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	14.5	13.5	12.7	12.0	11.4
	19	15.3	14.6	14.0	13.0	12.3
	22	16.3	15.6	15.0	14.3	13.4



Entering Air Temperature		Temperature Air Entering Condenser (°C D.B.)				
		25	30	35	40	43
		IPT	IPT	IPT	IPT	IPT
D.B.	W.B.	kW	kW	kW	kW	kW
27	17	3.98	4.34	4.74	5.15	5.46
	19	4.26	4.64	4.99	5.42	5.75
	22	4.60	5.01	5.39	5.80	6.15



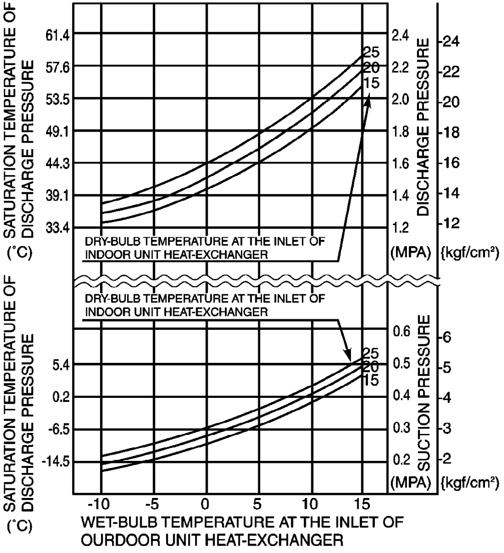
TC = Total Cooling Capacity
IPT = Power Consumption

16. DISCHARGE AND SUCTION PRESSURE

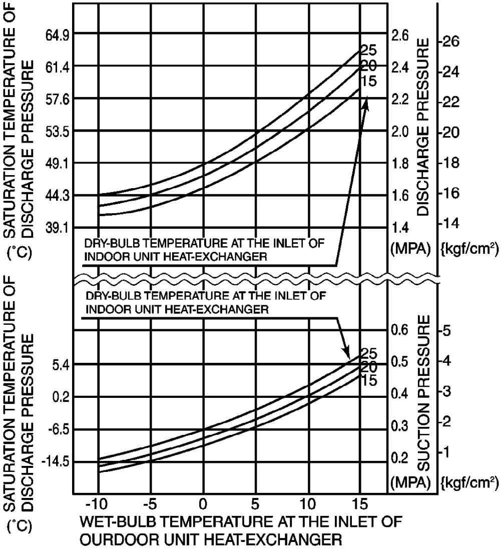
● **SATURATION TEMPERATURE OF DISCHARGE AND SUCTION PRESSURE**

HEATING (Heat pump model only)

50Hz

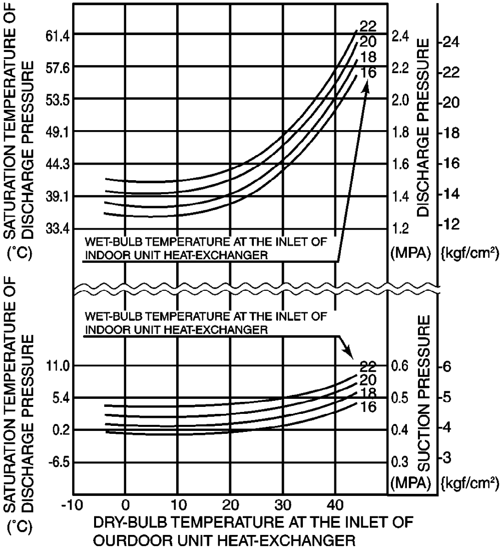


60Hz

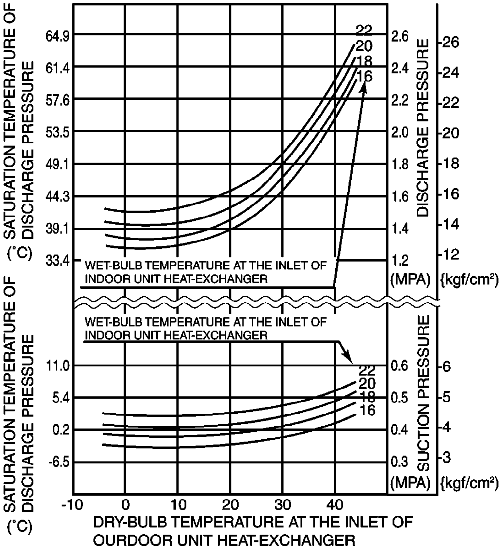


COOLING

50Hz

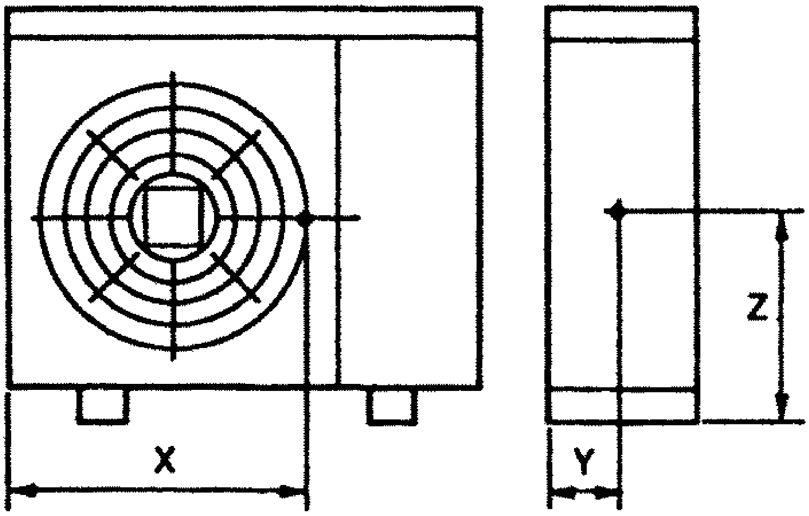


60Hz

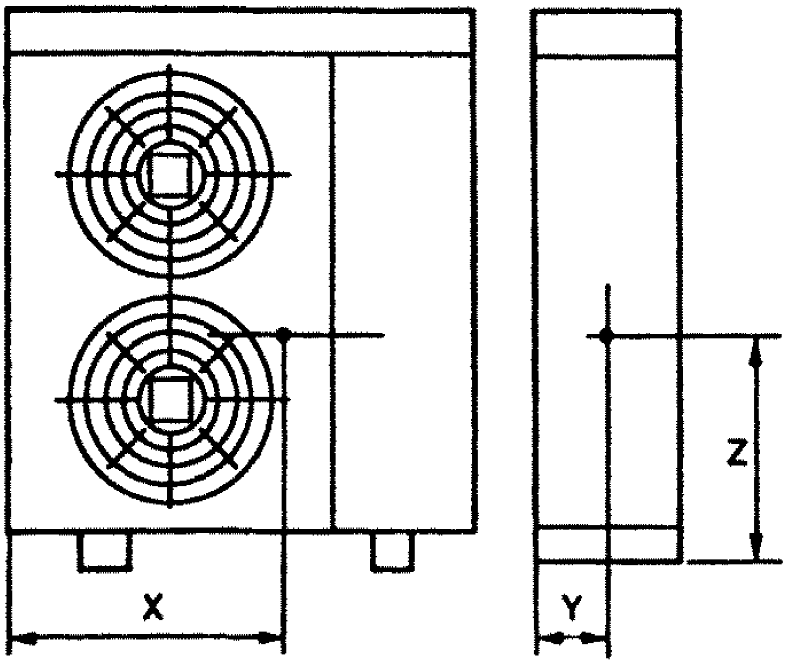


17. POSITION OF THE CENTER GRAVITY

24BBP ~ 28BBP



34BBP ~ 50BBP



MODEL NAME	OUTSIDE DIMENSIONS			NET WEIGHT	CENTRE OF GRAVITY		
	WIDTH (mm)	DEPTH (mm)	HEIGHT (mm)	kg	X (mm)	Y (mm)	Z (
CU-A24BBP5	900	900	320	81	560	160	3
CU-C24BBP5	900	900	320	80	560	160	3
CU-A28BBP5	900	900	320	82	580	160	3
CU-A28BBP8	900	900	320	82	580	160	3
CU-C28BBP5	900	900	320	81	580	160	3
CU-C28BBP6	900	900	320	81	580	160	3
CU-C28BBP8	900	900	320	81	580	160	3
CU-A34BBP5	1220	900	320	97	590	160	4
CU-A34BBP8	1220	900	320	97	590	160	4
CU-C34BBP5	1220	900	320	95	590	160	4
CU-C34BBP7	1220	900	320	95	590	160	4
CU-C34BBP8	1220	900	320	95	590	160	4
CU-A43BBP8	1220	1100	320	114	720	160	4
CU-C43BBP7	1220	1100	320	111	720	160	4
CU-C43BBP8	1220	1100	320	111	720	160	4
CU-A50BBP8	1220	1100	320	116	720	160	4
CU-C50BBP7	1220	1100	320	114	720	160	4
CU-C50BBP8	1220	1100	320	114	720	160	4

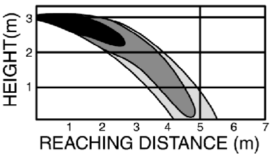
18. REACHING DISTANCE

■ >1.0m/s ▨ >0.5m/s □ >0.3m/s

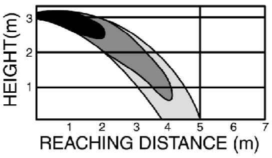
- **CS-A24BB4P**

< Cooling > (ANGLE AT OUTLET 10˚)

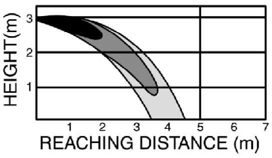
(High Speed)
(VELOCITY AT OUTLET 4.2m/s)



(Medium Speed)
(VELOCITY AT OUTLET 3.7m/s)

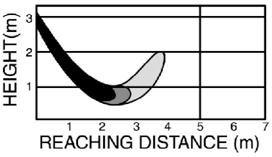


(Low Speed)
(VELOCITY AT OUTLET 3.2m/s)

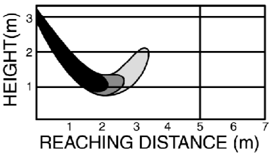


< Heating > (ANGLE AT OUTLET 70˚)

(High Speed)
(VELOCITY AT OUTLET 4.2m/s)



(Medium Speed)
(VELOCITY AT OUTLET 3.7m/s)



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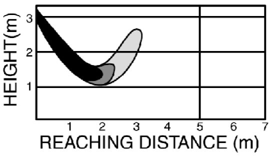
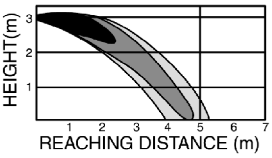
(VELOCITY AT OUTLET 3.2m/s)



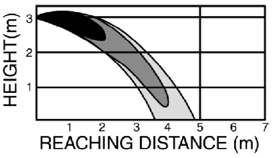
- **CS-A28BB4P**

< Cooling > (ANGLE AT OUTLET 10˚)

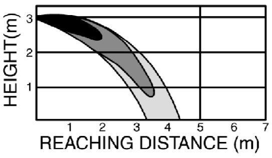
(High Speed)
(VELOCITY AT OUTLET 3.8m/s)



(Medium Speed)
(VELOCITY AT OUTLET 3.2m/s)

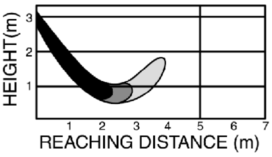


(Low Speed)
(VELOCITY AT OUTLET 2.8m/s)

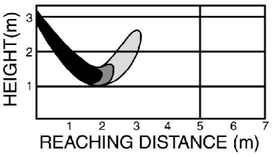


< Heating > (ANGLE AT OUTLET 70˚)

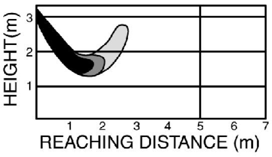
(High Speed)
(VELOCITY AT OUTLET 3.8m/s)



(Medium Speed)
(VELOCITY AT OUTLET 3.2m/s)



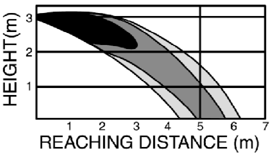
(Low Speed)
(VELOCITY AT OUTLET 2.8m/s)



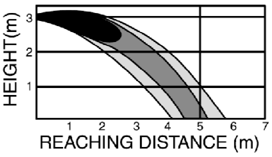
- **CS-A34BB4P**

< Cooling > (ANGLE AT OUTLET 10˚)

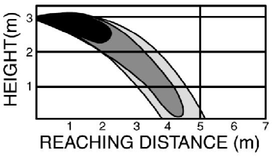
(High Speed)
(VELOCITY AT OUTLET 4.9m/s)



(Medium Speed)
(VELOCITY AT OUTLET 4.2m/s)

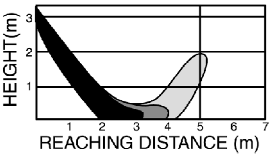


(Low Speed)
(VELOCITY AT OUTLET 3.6m/s)

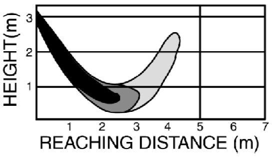


< Heating > (ANGLE AT OUTLET 70˚)

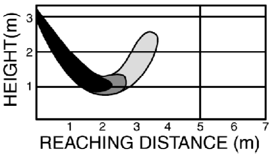
(High Speed)
(VELOCITY AT OUTLET 4.9m/s)



(Medium Speed)
(VELOCITY AT OUTLET 4.2m/s)



(Low Speed)
(VELOCITY AT OUTLET 3.6m/s)

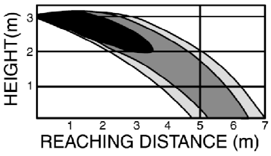


- **CS-A43BB4P**

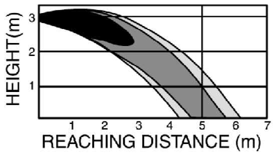
■ >1.0m/s ▨ >0.5m/s ☐ >0.3m/s

< Cooling > (ANGLE AT OUTLET 10˚)

(High Speed)
(VELOCITY AT OUTLET 5.7m/s)



(Medium Speed)
(VELOCITY AT OUTLET 4.7m/s)



(Low Speed)
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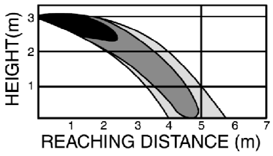
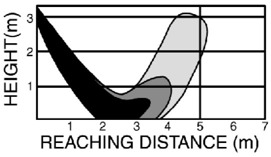


< Heating > (ANGLE AT OUTLET 70˚)

(High Speed)
(VELOCITY AT OUTLET 5.7m/s)



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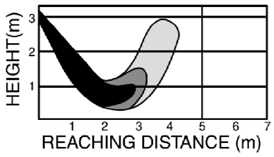
(VELOCITY AT OUTLET 4.7m/s)



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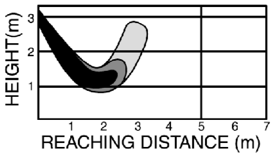
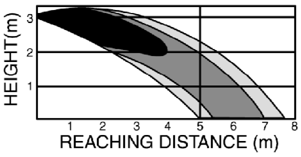


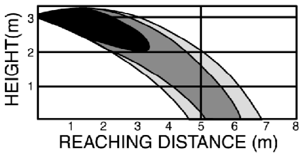
- **CS-A50BB4P**

< Cooling > (ANGLE AT OUTLET 10˚)

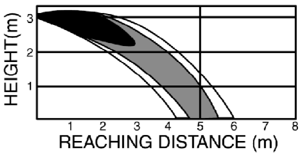
(High Speed)
(VELOCITY AT OUTLET 6.4m/s)



(Medium Speed)
(VELOCITY AT OUTLET 5.5m/s)

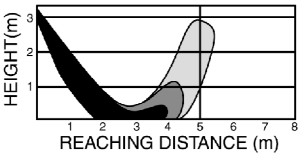


(Low Speed)
(VELOCITY AT OUTLET 4.5m/s)

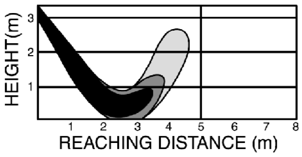


< Heating > (ANGLE AT OUTLET 70˚)

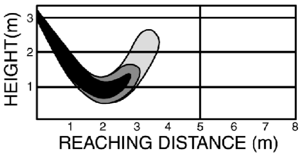
(High Speed)
(VELOCITY AT OUTLET 6.4m/s)



(Medium Speed)
(VELOCITY AT OUTLET 5.5m/s)



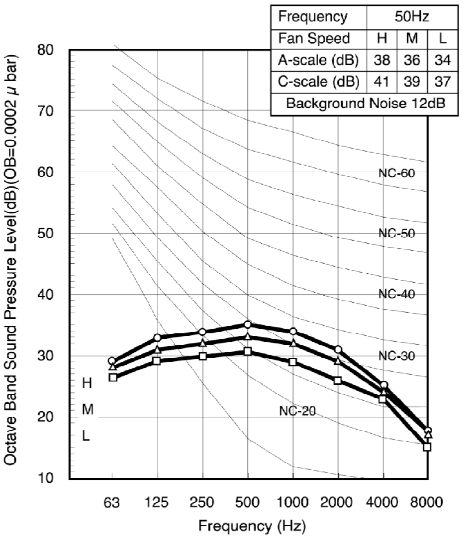
(Low Speed)
(VELOCITY AT OUTLET 4.5m/s)



19. SOUND DATA

CS-A24BB4P

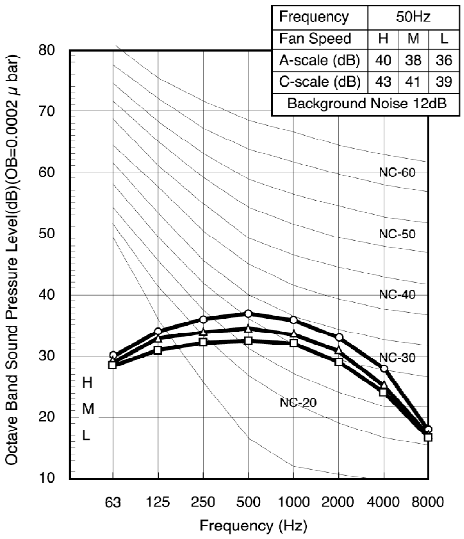
Octave Band Central Frequency (Hz)



Frequency	50Hz		
Fan Speed	H	M	L
A-scale (dB)	38	36	34
C-scale (dB)	41	39	37
Background Noise 12dB			

CS-A28BB4P

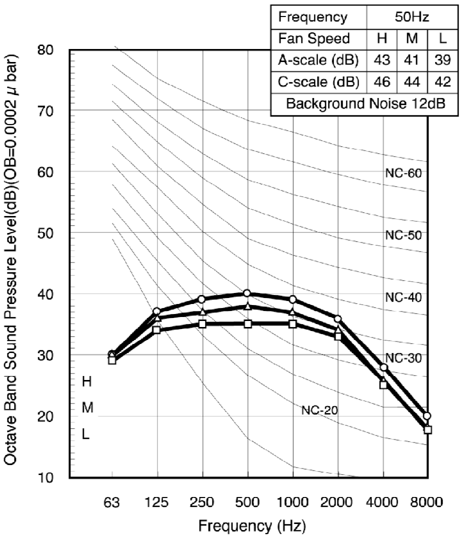
Octave Band Central Frequency (Hz)



Frequency	50Hz		
Fan Speed	H	M	L
A-scale (dB)	40	38	36
C-scale (dB)	43	41	39
Background Noise 12dB			

CS-A34BB4P (50Hz)

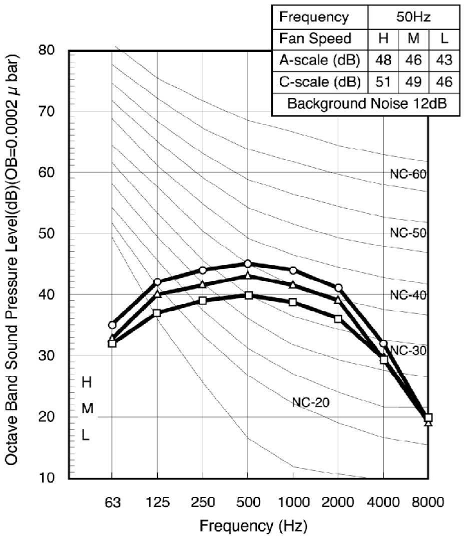
Octave Band Central Frequency (Hz)



Frequency	50Hz		
Fan Speed	H	M	L
A-scale (dB)	43	41	39
C-scale (dB)	46	44	42
Background Noise 12dB			

CS-A43BB4P (50Hz)

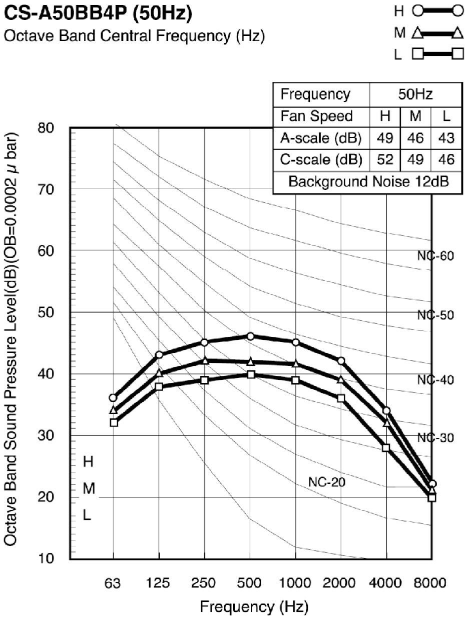
Octave Band Central Frequency (Hz)



Frequency	50Hz		
Fan Speed	H	M	L
A-scale (dB)	48	46	43
C-scale (dB)	51	49	46
Background Noise 12dB			

CS-A50BB4P (50Hz)

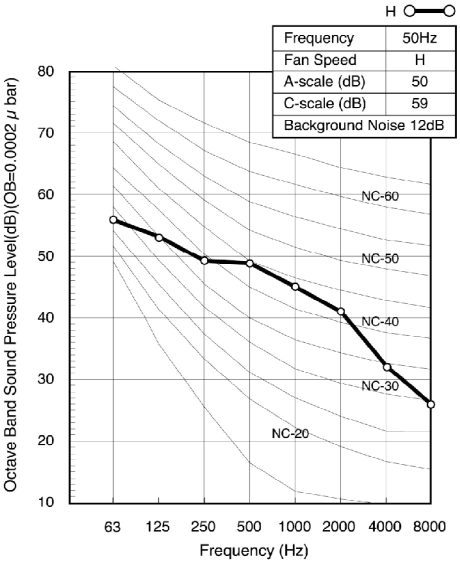
Octave Band Central Frequency (Hz)



Frequency	50Hz		
Fan Speed	H	M	L
A-scale (dB)	49	46	43
C-scale (dB)	52	49	46
Background Noise 12dB			

CU-A24BBP5 & CU-C24BBP5 (Cooling Noise Level)

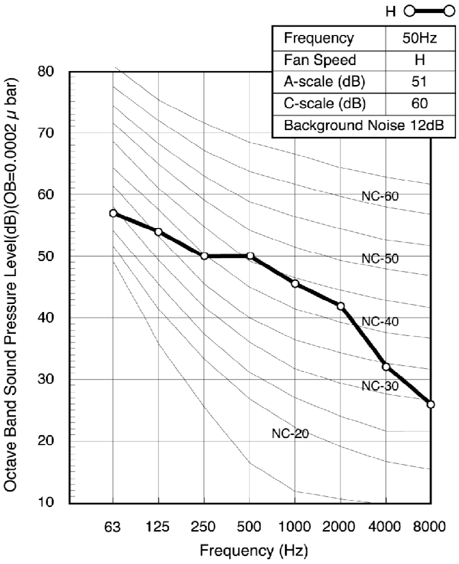
Octave Band Central Frequency (Hz)



Frequency	50Hz
Fan Speed	H
A-scale (dB)	50
C-scale (dB)	59
Background Noise 12dB	

CU-A24BBP5 (Heating Noise Level)

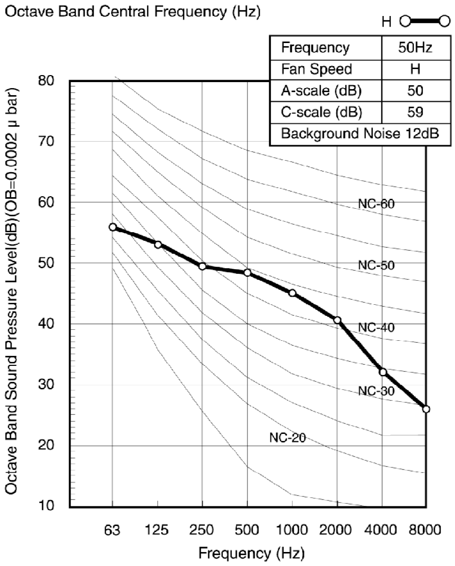
Octave Band Central Frequency (Hz)



Frequency	50Hz
Fan Speed	H
A-scale (dB)	51
C-scale (dB)	60
Background Noise 12dB	

CU-A28BBP5, CU-A28BBP8
CU-C28BBP5, CU-C28BBP8 (Cooling Noise Level)

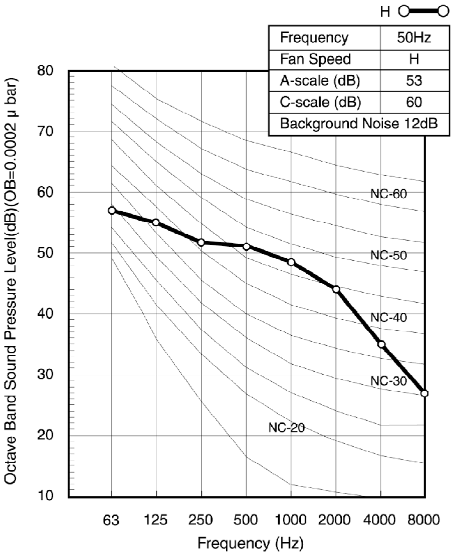
Octave Band Central Frequency (Hz)



Frequency	50Hz
Fan Speed	H
A-scale (dB)	50
C-scale (dB)	59
Background Noise 12dB	

CU-A28BBP5, CU-A28BBP8 (Heating Noise Level)

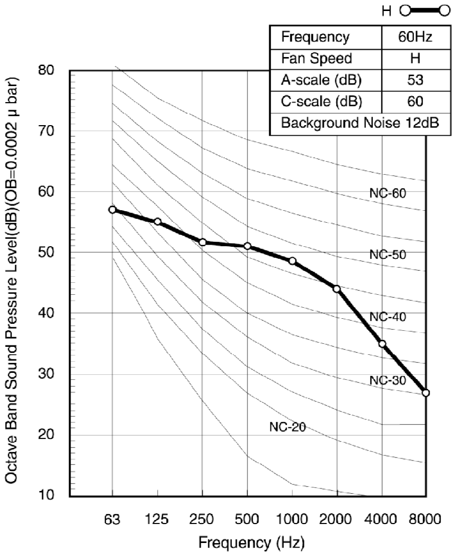
Octave Band Central Frequency (Hz)



Frequency	50Hz
Fan Speed	H
A-scale (dB)	53
C-scale (dB)	60
Background Noise 12dB	

CU-C28BBP6 (Cooling Noise Level)

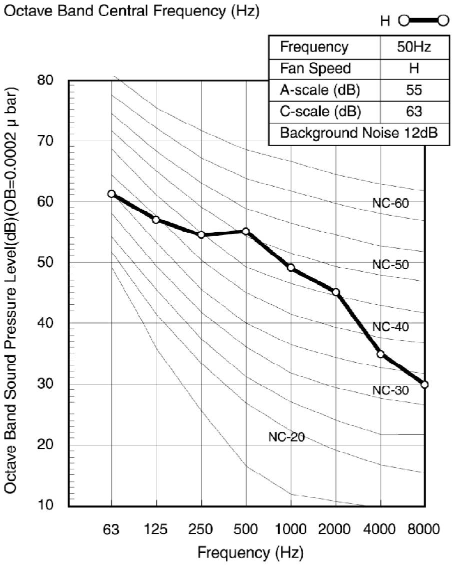
Octave Band Central Frequency (Hz)



Frequency	60Hz
Fan Speed	H
A-scale (dB)	53
C-scale (dB)	60
Background Noise 12dB	

CU-A34BBP5, CU-A34BBP8
CU-C34BBP5, CU-C34BBP8 (Cooling Noise Level)

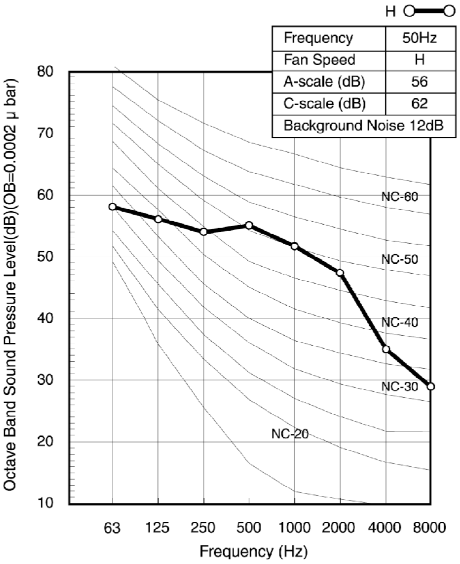
Octave Band Central Frequency (Hz)



Frequency	50Hz
Fan Speed	H
A-scale (dB)	55
C-scale (dB)	63
Background Noise 12dB	

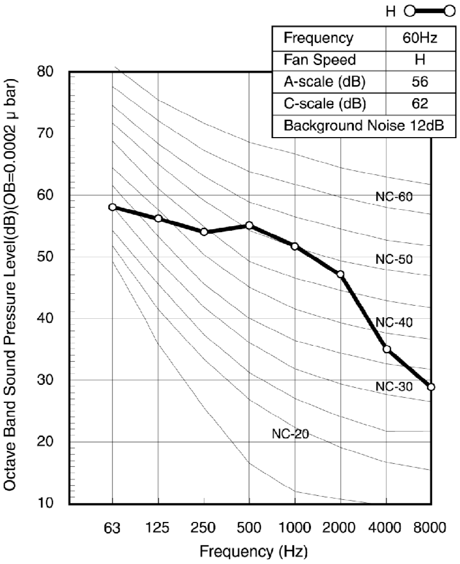
CU-A34BBP5, CU-A34BBP8 (Heating Noise Level)

Octave Band Central Frequency (Hz)



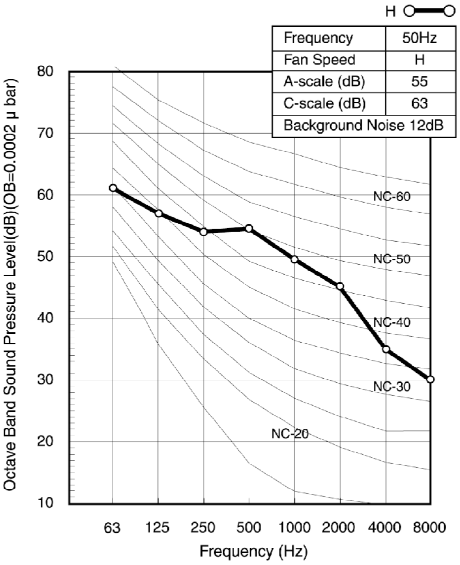
CU-C34BBP7 (Cooling Noise Level)

Octave Band Central Frequency (Hz)



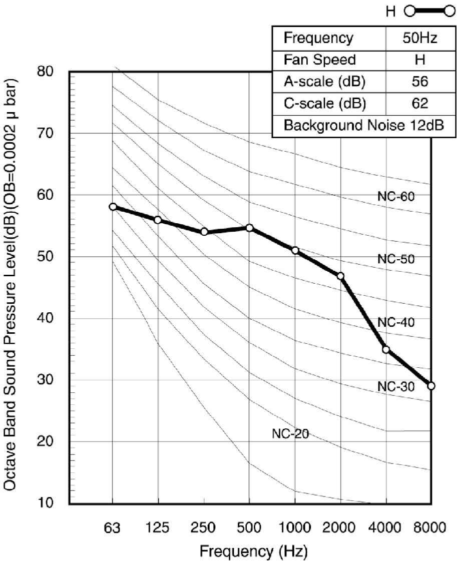
CU-A43BBP8, CU-C43BBP8 (Cooling Noise Level)

Octave Band Central Frequency (Hz)

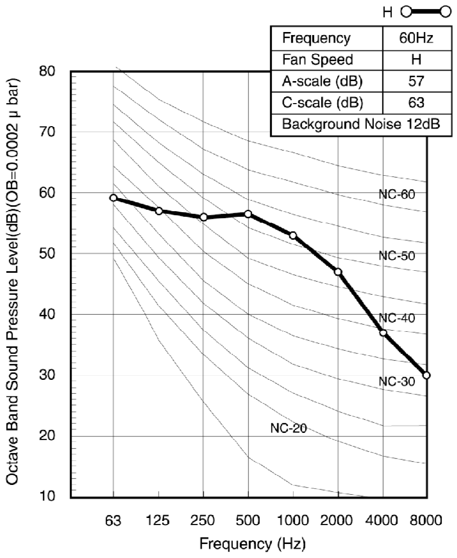


CU-A43BBP8 (Heating Noise Level)

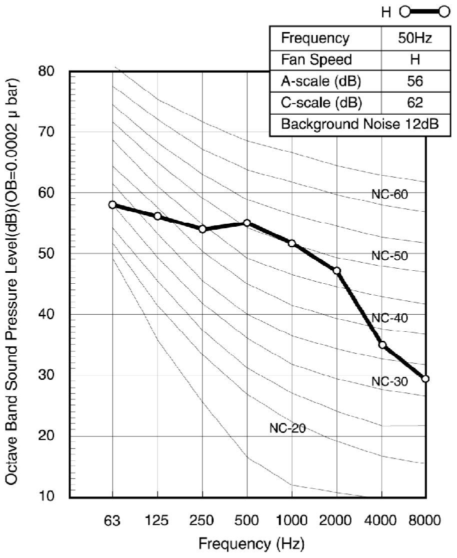
Octave Band Central Frequency (Hz)



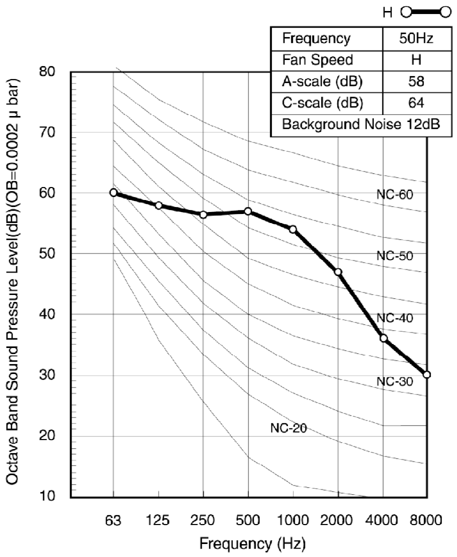
CU-C43BBP7 (Cooling Noise Level)
Octave Band Central Frequency (Hz)



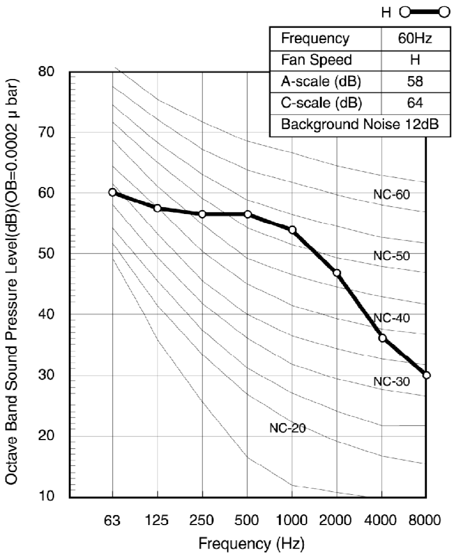
CU-A50BBP8, CU-C50BBP8 (Cooling Noise Level)
Octave Band Central Frequency (Hz)



CU-A50BBP8 (Heating Noise Level)
Octave Band Central Frequency (Hz)



CU-C50BBP7 (Cooling Noise Level)
Octave Band Central Frequency (Hz)



20. TWIN AND TRIPLE

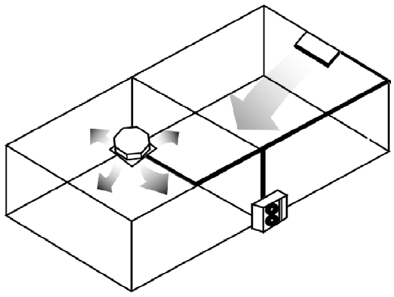
20.1. Twin and Triple Operation

- **Simultaneous air conditioning of wide spaces and corners is possible. Indoor units with different horsepowers can even be used in combination.**
- **Master unit and slave-units can be set automatically in twin and triple systems. No address setting is necessary.**
- **Multiple indoor units can be operated simultaneously with a single**

remote control unit. Note that individual operation is not possible.

Twin and Triple Combination Table

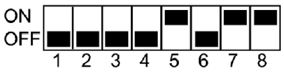
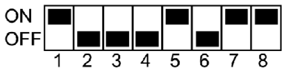
Outdoor unit	Simultaneous twin operation		Simultaneous triple operation	
	Standard	Horsepower difference	Standard	Horsepower difference
3.0 HP	▨ 3.0 ☐ 1.5 ☐ 1.5			
4.0 HP	▨ 4.0 ☐ 2.0 ☐ 2.0	▨ 4.0 ☐ 1.5 ☐ 2.5		
5.0 HP	▨ 5.0 ☐ 2.5 ☐ 2.5	▨ 5.0 ☐ 2.0 ☐ 3.0		
6.0 HP	▨ 6.0 ☐ 3.0 ☐ 3.0	▨ 6.0 ☐ 2.0 ☐ 4.0	▨ 6.0 ☐ 2.0 ☐ 2.0 ☐ 2.0	▨ 6.0 ☐ 1.5 ☐ 1.5 ☐ 3.0

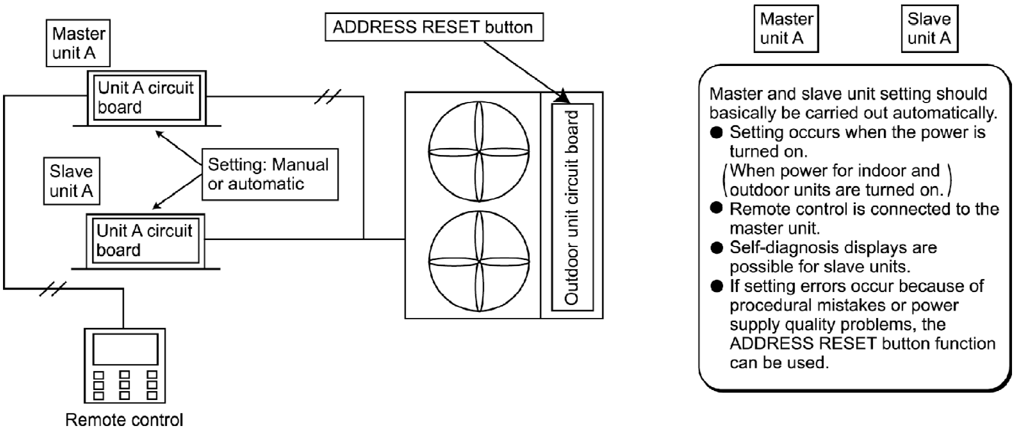


▨ : Outdoor unit capacity
☐ : Indoor unit capacity

20.1.1. Twin and triple operation setting

- The master unit and slave units are set automatically when the power is turned on. At this time, the indoor unit which is connected to the remote control unit becomes the master unit. / (If automatic setting is not possible, carry out the settings manually.)
- No distinction is made between master unit and slave units (slave unit 1 and slave unit 2) at the indoor unit or remote control.
- Install the remote control to the master unit. (It cannot be connected to slave units.) / If indoor unit models with louvres and models without louvres have been connected together, use an indoor unit with louvres as the master unit.
- The remote control termostat can also be set.
- Optional circuit boards can only be installed to the master unit.
- Setting the master unit and slave units can also be carried out manually by using DIP switches. However, manual settings will always take priority. If you have made manual settings but would like to return to using automatic settings, set all slave unit DIP switches (refer to the table below) to the OFF position, and then press the ADDRESS RESET button on the outdoor unit (SW3 on the outdoor unit printed circuit board). / (Do not mix manual settings and automatic settings.)

	Master unit	Slave unit	
		Slave unit 1 when connecting a triple system	Slave unit 2 when connecting a triple system
Manual setting	● It is not necessary to operate any switches on the master unit. The unit connected to the remote control will become the master unit.	 ON OFF 1 2 3 4 5 6 7 8 Set No. 8 to ON. All other switches can be ignored. (No. 5 and 7 are already set to ON at the time of shipment.)	 ON OFF 1 2 3 4 5 6 7 8 Set No. 1 and No. 8 to ON. (No. 5 and 7 are already set to ON at the time of shipment.)


Master unit A
Unit A circuit board
Slave unit A
Setting: Manual or automatic
Unit A circuit board
Remote control
ADDRESS RESET button
Outdoor unit circuit board
Master unit A
Slave unit A

Master and slave unit setting should basically be carried out automatically.

- Setting occurs when the power is turned on. (When power for indoor and outdoor units are turned on.)
- Remote control is connected to the master unit.
- Self-diagnosis displays are possible for slave units.
- If setting errors occur because of procedural mistakes or power supply quality problems, the ADDRESS RESET button function can be used.

20.1.2. Automatic address setting for twin and triple systems

Procedure:

Turn on the power supply for the indoor and outdoor units.

Operation:

Automatic address setting will start 10 to 30 seconds after the power supply is turned on, and will be completed after about 1 minute.

If the power supplies for the indoor unit and outdoor unit cannot be turned on at the same time, turn on the power supply for the outdoor unit, the indoor unit which is connected to the remote control, and then the other indoor units in that order.

If the order of turning on the power supply is incorrect, the master unit setting may overlap. In such a case, turn on the power supplies for all units in the correct order as given above, or carry out a twin/triple automatic address reset (press dip switch 3 on the outdoor unit continuously for 4 seconds or longer).

- The indoor unit which is connected to the remote control will have

priority for becoming the master unit.

- **The master unit thermostat will be used as the indoor temperature thermostat. If the master unit thermostat is turned on, the slave unit thermostats cannot be adjusted even if they happen to be on.**
- **If address setting using the DIP switches is carried out after automatic address setting has been carried out, use DIP switch No. 3 (SW3) on the outdoor unit to carry out automatic address resetting.**
- **If you would like to designate a particular indoor unit as the master unit because no master unit has been set, use the DIP switches on the slave units to make setting.**

If automatic address setting is carried out once and then the slave unit address are set, the address will then be stored inside the EEPROM. Thus it is not necessary to repeat automatic address setting if the power is turned off and back on again.

20.1.3. DIP switch settings for twin/triple slave unit addresses

Procedure:

Turn off the power supply, and then set DIP switch 1-8 to ON. / The unit will become slave unit 1. / (Set DIP switches 1-1 and 1-8 both to ON. / The unit will become slave unit 2.) / Turn on the power supply.

Operation:

The unit will operate as slave unit 1. Automatic address setting is not carried out at this time.

If the setting is made while the power is still turned on, it is easier to mis-combine the setting with group settings. So, the setting should be made while the power is turned off.

- **Only slave unit addresses can be set in this way. Master unit setting is not possible.**
- **If you make the DIP switch settings after the power has been turned on, carry out twin/triple automatic address resetting.**
- **Be sure to set DIP switch 1-8 to ON when setting twin/triple addresses. If DIP switch 1-1 is set to ON without setting 1-8 to ON,**

group addresses will be set instead, and the remote control open circuit error code (F26) will be displayed.

20.1.4. Automatic address resetting for twin/triple systems

Function:

- This reset the current twin/triple addresses which have been set automatically, and result in the reoccurance of automatic twin/triple address settings.

Procedure:

Press the ADDRESS RESET button SW3 (push button switch) on the outdoor unit circuit board continuously until LEDs 2 to 8 on the outdoor unit circuit board are all illuminated (takes approximately 3.5 seconds).

Operations:

The outdoor unit will reset the addresses for the indoor units which it is connected to, and will send an instruction to carry out automatic address setting again. If the indoor unit DIP switch have not been manually set for twin/triple address setting, the indoor units receive this command and clear their existing settings and carry out automatic address setting.

If an indoor unit has had its address set by the DIP switch (DIP switch 1-8 is ON), or if the remote control unit is connected to one of the indoor unit, then the addresses for those indoor units cannot be reset.

- The indoor units will not run for approximately 1 minute while automatic twin/triple address resetting is being carried out.
- Do not turn off the power supply for at least 1 minute after automatic twin/triple address resetting has been carried out.

20.2. Piping connections

- The following table shows the pipe diameters for a twin-type system.

Outdoor unit main pipe diameter (mm)				Indoor unit combinations			
	3HP	Indoor unit capacity (HP)		1.5	1.5		
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 6.35	ø 6.35		
Gas side:	ø 15.88		Gas side	ø 12.7	ø 12.7		
	4HP	Indoor unit capacity (HP)		2.0	2.0	1.5	2.5
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 6.35	ø 6.35	ø 6.35	ø 6.35
Gas side:	ø 19.05		Gas side	ø 12.7	ø 12.7	ø 12.7	ø 15.88
	5HP	Indoor unit capacity (HP)		2.5	2.5	2.0	3.0
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 6.35	ø 6.35	ø 6.35	ø 9.52
Gas side:	ø 19.05		Gas side	ø 15.88	ø 15.88	ø 12.7	ø 15.88
	6HP	Indoor unit capacity (HP)		3.0	3.0	2.0	4.0
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 9.52	ø 9.52	ø 6.35	ø 9.52
Gas side:	ø 19.05		Gas side	ø 15.88	ø 15.88	ø 12.7	ø 19.05

- **The following table shows the pipe diameters for a triple-type system.**

Outdoor unit main pipe diameter (mm)				Indoor unit combinations					
	6HP	Indoor unit capacity (HP)		2.0	2.0	2.0	1.5	1.5	3.0
Liquid side:	ø 9.52	Branch pipe diameter	Liquid side	ø 6.35	ø 6.35	ø 6.35	ø 6.35	ø 6.35	ø 9.52
Gas side:	ø 19.05		Gas side	ø 12.7	ø 12.7	ø 12.7	ø 12.7	ø 12.7	ø 15.88

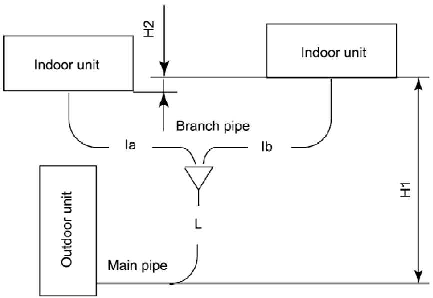
- **The following table shows the equivalent pipe lengths and height**

differences for twin- and triple-type systems.

Equivalent length	**L + la + lb + lc**				**Within 50 m**
Branch pipe diameter	**la, lb, (lc)**				**Within 15 m**
Branch pipe difference	**la - lb, lb - (lc), la - (lc)**				**Within 10 m**
Height difference	**H1**	**Within 30 m**	**Height difference between indoor units**	**H2**	**Within 1 m**

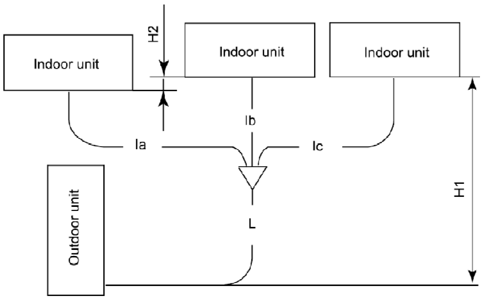
Note:

1. **Use the main pipe to gain any rise or fall required for the pipes.**
2. **The number of bends should be 8 or less in a single system (L + la, L + lb, L + lc), and 15 or less overall.**
3. **Branch pipes should be position horizontally.**



Indoor unit
H2
Indoor unit
Branch pipe
la
lb
Outdoor unit
L
H1
Main pipe

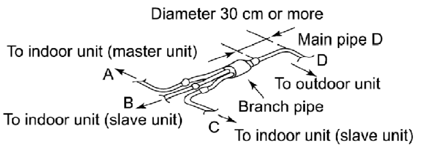
(Twin type)



Indoor unit
H2
Indoor unit
Indoor unit
lb
la
lc
Outdoor unit
L
H1

(Triple type)

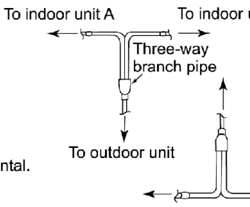
- The branch pipe shoud be horizontal to or perpendicular to the indoor unit.



Diameter 30 cm or more
To indoor unit (master unit)
Main pipe D
D
A
To outdoor unit
B
Branch pipe
To indoor unit (slave unit)
C
To indoor unit (slave unit)

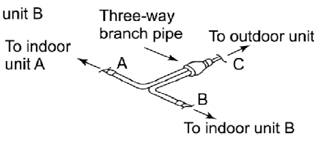
*A, B, C and D should be horizontal.

Horizontal connection



To indoor unit A
To indoor unit B
Three-way branch pipe
To outdoor unit

Vertical installation



Three-way branch pipe
To outdoor unit
To indoor unit A
A
C
B
To indoor unit B

*A, B and C should be horizontal.

Horizontal installation

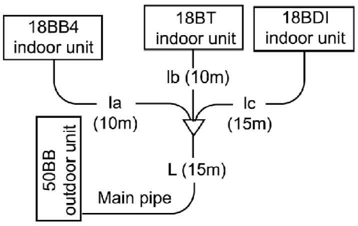
20.3. Refrigerant charging

- For twin and triple-type systems / The pipe length is the total of the branch pipe (L) and the junction pipes (la → lb → lc in order from the thickest diameter). At the point where the pipe length exceeds 30 m, determine the amount of refrigerant for the remaining liquid-

side pipe diameters and pipe lengths from the following table in order to charge the system.

Liquid-side pipe diameter	ø6.35	ø9.52
Additional charging amount (kg/m)	0.02	0.05

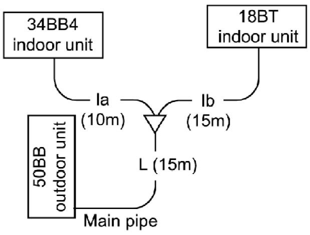
Example 1: For 50BB outdoor unit with an equivalent pipe length of 50 m


18BB4 indoor unit
18BT indoor unit
18BDI indoor unit
lb (10m)
la (10m)
lc (15m)
50BB outdoor unit
L (15m)
Main pipe

(Triple type)

		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)		ø9.52	15m	Not needed if within 30m
Main pipe	(la)	ø6.35	10m	Not needed if within 30m
	(lb)	ø6.35	10m	If exceeds 30m, 5m × 0.02 = 0.1
	(lc)	ø6.35	15m	15m × 0.02 = 0.3
——			50m	Total 0.4 kg

Example 2: For 50BB outdoor unit with an equivalent pipe length of 40 m

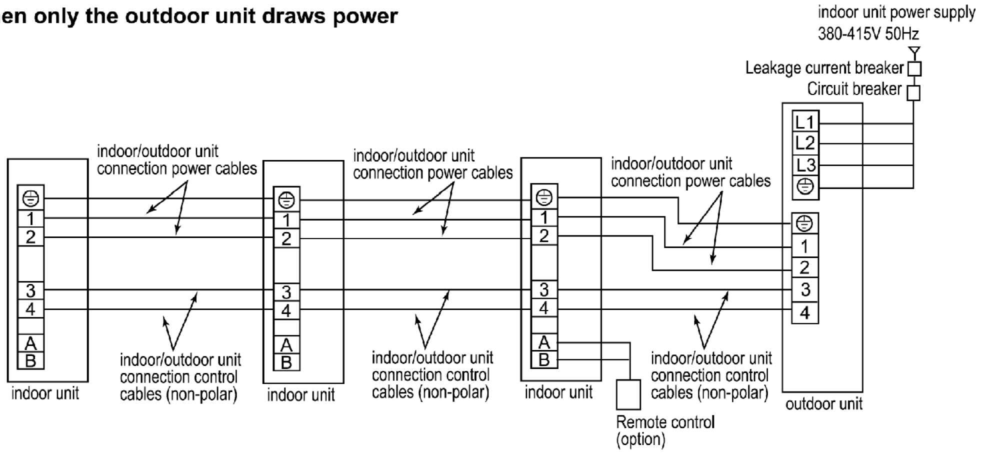

34BB4 indoor unit
18BT indoor unit
la (10m)
lb (15m)
50BB outdoor unit
L (15m)
Main pipe

(Twin type)

		Liquid pipe diameter	Equivalent length	Additional charging amount for each pipe (kg)
Main pipe (L)		ø9.52	15m	Not needed if within 30m
Main pipe	(la)	ø9.52	10m	Not needed if within 30m
	(lb)	ø6.35	15m	If exceeds 30m, 10m × 0.02 = 0.2
——			40m	Total 0.2 kg

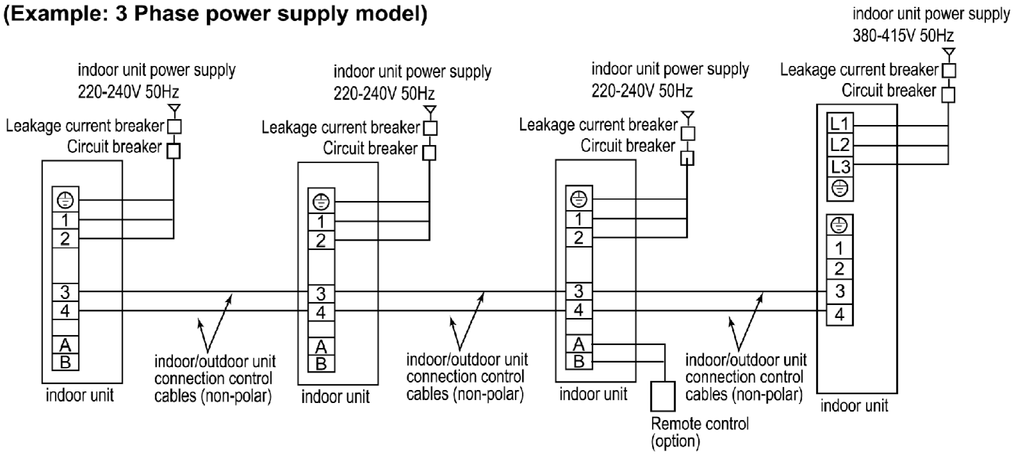
20.4. Wiring

Connection 1:
When only the outdoor unit draws power


indoor unit power supply
380-415V 50Hz
Leakage current breaker
Circuit breaker
L1
L2
L3
indoor/outdoor unit connection power cables
indoor/outdoor unit connection power cables
indoor/outdoor unit connection power cables
1
2
3
4
A
B
indoor unit
indoor/outdoor unit connection control cables (non-polar)
indoor unit
indoor/outdoor unit connection control cables (non-polar)
indoor unit
indoor/outdoor unit connection control cables (non-polar)
Remote control (option)
outdoor unit

Connection 2:

When both indoor and outdoor unit draw power
(Example: 3 Phase power supply model)

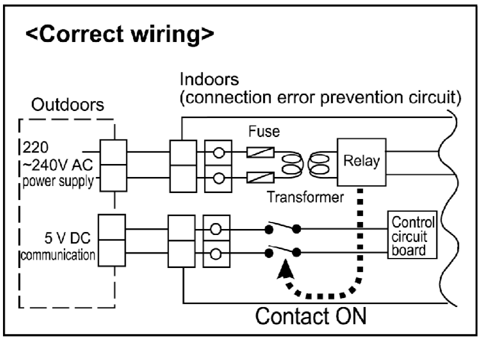

indoor unit power supply
380-415V 50Hz
indoor unit power supply
220-240V 50Hz
indoor unit power supply
220-240V 50Hz
indoor unit power supply
220-240V 50Hz
Leakage current breaker
Circuit breaker
L1
L2
L3
1
2
3
4
A
B
indoor unit
indoor/outdoor unit connection control cables (non-polar)
indoor unit
indoor/outdoor unit connection control cables (non-polar)
indoor unit
indoor/outdoor unit connection control cables (non-polar)
Remote control (option)
indoor unit

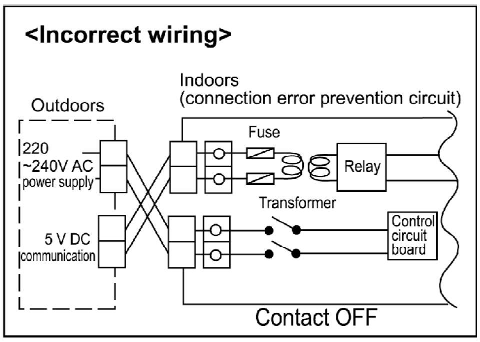
Important

* For the above connection 2, if outdoor terminal 1 & terminal 2 are joined to indoor terminal 3 & terminal 4 by mistake upon operation, the control circuit board will be defected. (Wiring mistake prevention is not applicable for this connection).

21. WIRING MISTAKE PREVENTION

Improved quality of installation work through adoption of an "Connection error prevention" circuit which prevents wiring mistakes


<Correct wiring>
Outdoors
Indoors
(connection error prevention circuit)
220
~240V AC
power supply
5 V DC
communication
Fuse
Relay
Transformer
Control circuit board
Contact ON


<Incorrect wiring>
Outdoors
Indoors
(connection error prevention circuit)
220
~240V AC
power supply
5 V DC
communication
Fuse
Relay
Transformer
Control circuit board
Contact OFF

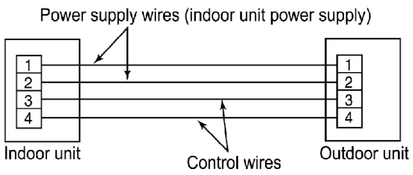
Connection errors with the control wires and the power supply wires will not only contribute to burning-out of the control circuit board, but can also cause large-scale working losses and affect reliability. If a circuit board with a "Connection error prevention" circuit is used, the relay

will not operate if the wires have been connected incorrectly, so that current will not flow to the control circuit board. This is designed principally to conpensate human error during installation.

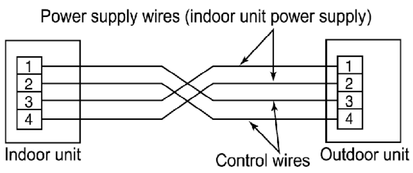
Prevention of connection errors

These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have been operated. In such cases, check that the power supply wires (connected to terminals [1] and [2] and the control wires (connected to terminals [3] and [4]) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.

(CORRECT)



(INCORRECT)



- Do not short the remote control wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

NOTE:

- Wait one minute after turning on the indoor unit power supply before operating the remote control.
- If nothing at all appears in the remote control LCD, check the power supply for the indoor unit. / Refer to “TROUBLESHOOTING” chapter.

NOTE:

Do not allow any of the following connection, as such connection may damage the printed circuit board.

- Do not connect anything except a relay to the timer input or fan speed output (connector CNT1 on printed circuit board).
- Do not connect U-NET transmission wires to terminals 3 and 4 of the indoor and outdoor units. (*1)
- Do not connect U-NET transmission wires to terminals A and B of the remote control.
  (1*) U-NET transmission wires are the communication wires used for the central control.

22. TEST OPERATION AND SELF DIAGNOSIS

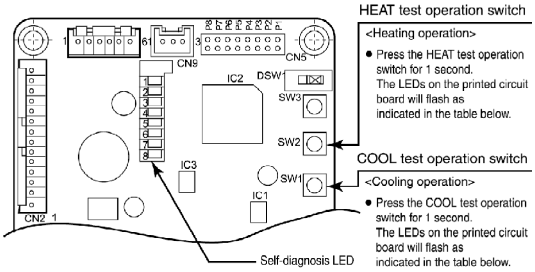
22.1. Test operation

- Always use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or any metallic object).

- **Never turn on the power supply until all installation work has been completed.**
- **Turn on the circuit breaker before test operation extends past 12 hours. / (The crankcase heater will be energized, which will warm the compressor and prevent liquid compression.)**
- **For three-phase models, check that the phase is not reversed. / (If the phase is reversed, the LED on the printed circuit board will flash.)**
- **Check that the voltage is 198 V or higher when starting the unit. (The unit will not operate if the voltage is less than 198V.)**
- **Carry out test operation for 5 minutes or more, using the remote control or the switch on the outdoor unit printed circuit board.**
- **Always carry out cooling operation first during test operation, even during the warm season. / (If heating is carried out first, problems with operation of the compressor will result.)**

22.2. Test operation from the outdoor unit

(Outdoor unit printed circuit board)



HEAT test operation switch

<Heating operation>

- Press the HEAT test operation switch for 1 second. The LEDs on the printed circuit board will flash as indicated in the table below.

COOL test operation switch

<Cooling operation>

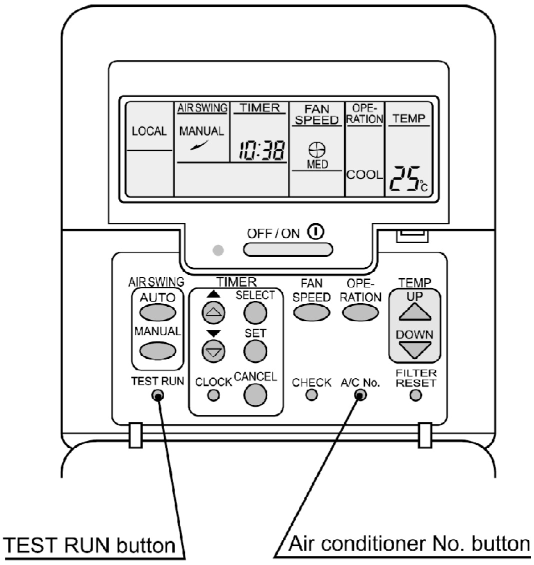
- Press the COOL test operation switch for 1 second. The LEDs on the printed circuit board will flash as indicated in the table below.

During outdoor unit emergency operation or test operation, the LEDs on the printed circuit board will flash.

	LEDs on outdoor unit printed circuit board						
	LED2	LED3	LED4	LED5	LED6	LED7	LED8
Emergency operation display			☼	☼	☼		
Cooling test operation from outdoor unit	☼	☼	☼				
Heating test operation from outdoor unit					☼	☼	☼

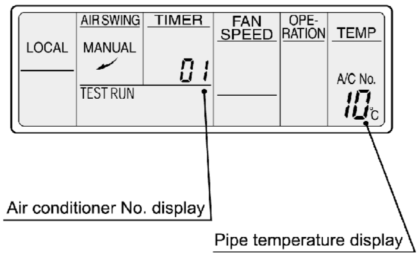
To cancel test operation, press the TEST RUN button once more while test operation is being carried out. / (Test operation will stop automatically after 30 minutes have passed.)

22.3. Test operation using the wired remote control


LOCAL
AIR SWING
MANUAL
TIMER
10:38
FAN SPEED
MED
OPE-RATION
COOL
TEMP
25℃
OFF / ON
AIR SWING
AUTO
MANUAL
TIMER
SELECT
SET
CLOCK
CANCEL
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CHECK
A/C No.
FILTER RESET
TEST RUN button
Air conditioner No. button

1. **Check that "COOL" is displayed on the operation mode display, and then press the OFF/ON button to start test operation.**
2. **Within 1 minute of pressing the OFF/ON button, press the TEST RUN button.**
3. **The pipe temperature (gas pipe) will then be displayed in the temperature setting display of the remote control.**

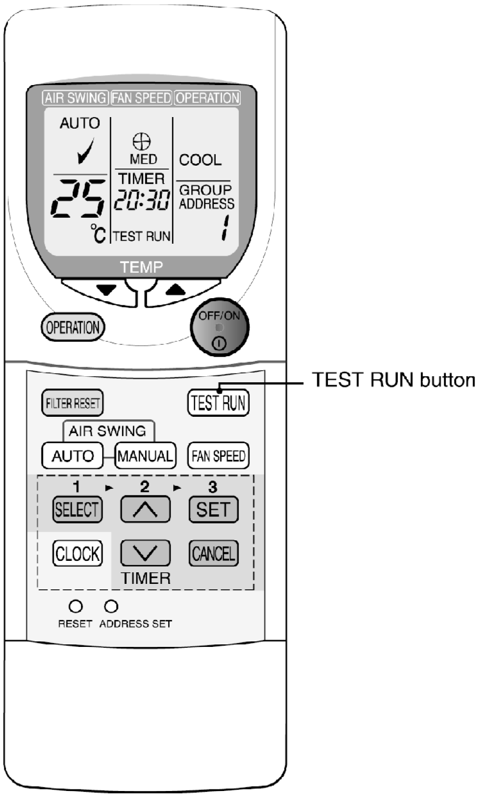
(Example)


LOCAL
AIR SWING
MANUAL
TEST RUN
TIMER
01
FAN SPEED
OPE-RATION
TEMP
A/C No.
10℃
Air conditioner No. display
Pipe temperature display

- **During group control, the number appearing in the timer display will change each time the air conditioner No. button is pressed, and the pipe temperature for the indoor unit corresponding to the number displayed will appear in the temperature setting display.**

4. **Check that the temperature in the pipe temperature display starts dropping after operation has been continuing for some time.**

22.4. Test operation using the wireless remote control


AIR SWING
FAN SPEED
OPERATION
AUTO
MED
COOL
TIMER
25
20:30
GROUP ADDRESS
℃
TEST RUN
1
TEMP
OPERATION
OFF/ON
TEST RUN button
FILTER RESET
TEST RUN
AIR SWING
AUTO
MANUAL
FAN SPEED
1
2
3
SELECT
SET
CLOCK
CANCEL
TIMER
RESET
ADDRESS SET

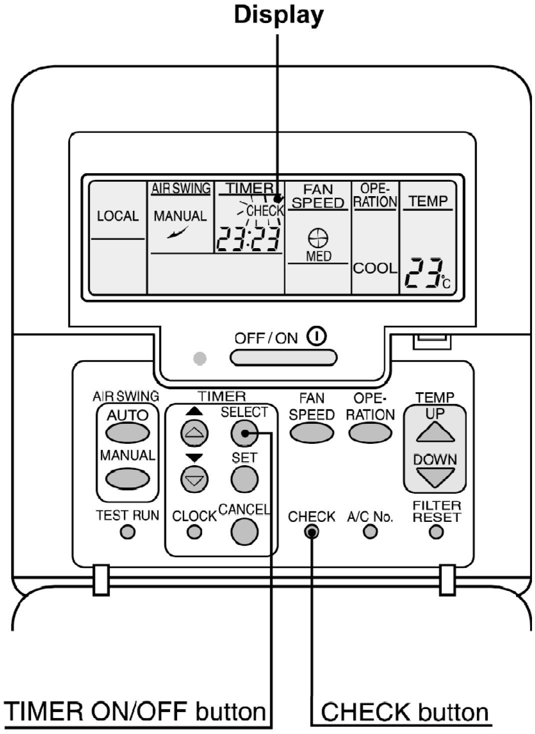
1. **Within 1 minute of pressing the OFF/ON button, press to cooling operation and then press the TEST RUN button.**
   - **If more than 1 minute passes, test operation cannot be started. In this case, press the OFF/ON button once more to repeat the operation.**
   - **Use the OPERATION button to change the operation. / The current operation mode will appear in the operation mode display.**
2. **When test operation starts, "TEST RUN" will appear in the timer display of the LCD, and operation will be carried out in accordance with the operation mode display (COOL or HEAT) appearing at that time. / However, the number in the temperature setting display will not change.**

(Cancelling test operation)

- **Press the OFF/ON button, the TEMP (UP/DOWN) button, the OPERATION button, the FAN SPEED button or the TEST RUN button to cancel test operation.**

22.5. Self-diagnosis function

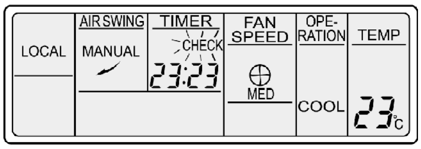
- **The wired remote control display and the self-diagnosis LEDs (red) on the outdoor unit printed circuit board indicate where the abnormality has occurred.**
- **Recalling the error display.**


Display
LOCAL
AIR SWING
MANUAL
TIMER
CHECK
23:23
FAN SPEED
MED
OPE-RATION
COOL
TEMP
23°C
OFF / ON
AIR SWING
AUTO
MANUAL
TIMER
SELECT
SET
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET
TIMER ON/OFF button
CHECK button

<Air conditioner No.>

- **The air conditioner No. "01" appears during normal installation and use. When using group control, a different number may appear. The air conditioner No. can be displayed by pressing the air conditioner No. button.**

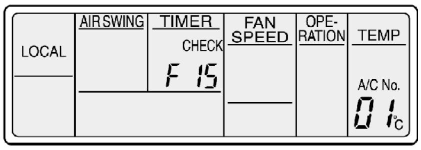
(Example)


LOCAL
AIR SWING
MANUAL
TIMER
CHECK
23:23
FAN SPEED
MED
OPE-RATION
COOL
TEMP
23°C

When an abnormality occurs at this unit, "CHECK" flashes in the display. /

Press the CHECK button while the display is flashing. /

(Example)

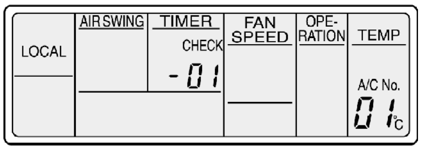

LOCAL
AIR SWING
TIMER
CHECK
F 15
FAN SPEED
OPE-RATION
TEMP
A/C No.
01°C

The timer display will change and an error code from F15 to F49 will appear in place of the time. (The temperature setting display

will also change to show the air conditioner No.) /

Press the TIMER SELECT/SET button while the error is displayed. /

(Example)


LOCAL
AIR SWING
TIMER
CHECK
-01
FAN SPEED
OPE-RATION
TEMP
A/C No.
01°C

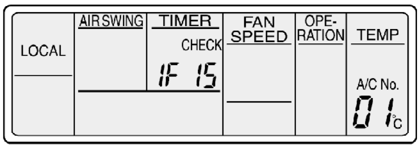
The F15 - F49 display will change to the detail display. /

- **After checking the error display and the detail display, refer to the self-diagnosis error code table on the following page and check the location of the problem.**
- **If the problem is repaired and operation returns to normal, the CHECK display on the remote control will be eliminated, but the self-diagnosis LED will remain illuminated until the operation starts again.**

How to display the past error message /

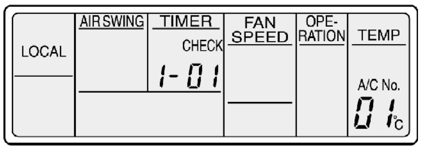
If the "CHECK" display on the wired remote control is not flashing, press the CHECK button continuously for 5 seconds or more to display the problem details for the last problem or the problem before that. You can then switch between the displays for the previous problem and the problem before that by pressing the TIMER FORWARD or BACK buttons. / (Last problem display: 1F15 - 1F49 / Second-last problem display: 2F15 - 2F49) / / Press the CHECK button once more to return to the normal display. /

(Example of last problem display)


LOCAL
AIR SWING
TIMER
CHECK
1F 15
FAN SPEED
OPE-RATION
TEMP
A/C No.
01°C

/ An error code from 1F15 to 1F49 will be displayed. / (The temperature setting display will also change to show the air conditioner No.) /

(Example)


LOCAL
AIR SWING
TIMER
CHECK
1-01
FAN SPEED
OPE-RATION
TEMP
A/C No.
01°C

/ If the TIMER SELECT/SET button is pressed while the error code from 1F15 to 1F49 is being displayed, the display screen will change to show the details of the last problem display. / (If 2F15 to 2F49 is being displayed, the details of the second-last problem display will appear.)

- **Self-diagnosis error code table**

☼: Flashing O: Illuminated Blank: Off

Remote control display			Printed circuit board self-diagnosis LED (red)								Error display (Check location)
Wired		Wireless	Indoor unit	Outdoor unit							
Error display	Detail display	Operation LED	LED2	LED2	LED3	LED4	LED5	LED6	LED7	LED8	
F15	-01	☼	☼	☼				☼	(※2)	(※2)	Drain level float switch problem Drain pump and drain pipe, indoor unit connectors CN6 & CN10, or relay connector
F16	-01	☼	☼		☼			☼	(※2)	(※2)	Louvre switch problem Louver motor, veneer panel connection terminal, or indoor unit connectors CN1 & CN 6
F17	-01	☼	☼	☼	☼			☼	(※2)	(※2)	Option problem Option connection terminals
F20	-01	☼	☼	☼			☼		(※2)	(※2)	Indoor temperature thermistor problem Indoor temperature thermistor lead wire or indoor unit connector CN1
	-02	☼	☼	☼		☼	☼		(※2)	(※2)	Remote control thermistor problem Remote control thermistor
F21	-01	☼	☼		☼		☼		(※2)	(※2)	Pipe temperature thermistor problem (indoor unit side) Pipe temperature thermistor lead wire or indoor unit connector CN1
F25	-01	☼	☼			☼			(※2)	(※2)	Centralised control address overlap problem Check settings for optional centralised control circuit board address switch
F26	-01	☼	☼		☼				(※2)	(※2)	Remote control transmission wire open circuit problem Remote control unit cable and connection terminals
	-02	☼	☼	☼					(※2)	(※2)	Remote control transmission problem Check the transmission wave pattern
F27	-01	☼	☼		☼				☼		Indoor/outdoor unit transmission wire open circuit problem Indoor/outdoor unit connection cable and connection terminals, or indoor unit and outdoor unit power supplies
	-02	☼	☼	☼					☼		Indoor/outdoor unit transmission problem Check the transmission wave pattern
F29	-01	☼	☼		☼		☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c. board
	-02	☼	☼	☼			☼	☼	(※2)	(※2)	Indoor unit setting problem Abnormal setting of the indoor p.c. board
	-12	☼	☼	☼		☼	☼	☼	(※2)	(※2)	Remote control unit setting problem Abnormal setting of the remote control
F30	-02	☼	☼	☼		☼		☼	☼		Negative or open phase power supply Check the main power supply terminal board connections, and switch the main power supply phase
	-06	☼	☼		☼	☼		☼	☼		Poor power supply connection, or distorted voltage wave pattern Check the main power supply terminal board connections, and check the power supply wave pattern.
	-07	☼	☼	☼	☼	☼		☼	☼		Poor power supply connection Check the main power supply terminal board connections
F31	-02	☼	☼		☼			☼	☼		High-pressure cut-off Refrigeration system, Obstructing of the heat radiation from outdoor unit
F33	-01	☼	☼	☼				☼	☼		Compressor overcurrent protection Open phase or lock in compressor, or blown main power supply fuse
	-02	☼	☼	☼	☼			☼	☼		Compressor discharge temperature protection Insufficient gas
F40	-41	☼	☼	☼			☼		☼		Compressor discharge temperature thermistor problem Discharge temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
	-61	☼	☼		☼		☼		☼		Heat exchanger outlet temperature thermistor problem (Outdoor unit) Heat exchanger outlet temperature thermistor lead wire, outdoor unit connector CN2, or relay connector
F41	-02	☼	☼	☼		☼	☼		☼		High-pressure switch open circuit problem High-pressure swich lead wire, outdoor unit connector CN2, or relay connector
	-03	☼	☼		☼	☼	☼		☼		Heating pressure switch open circuit problem Heating pressure switch lead wire, outdoor unit connector CN2, or relay connector
F42	-01	☼	☼	☼	☼		☼		☼		Current detector open circuit or compressor current problem Outdoor unit connector CN2, compressor internal protection system activated, or blown main power supply fuse
F49	-01	☼	☼		☼		☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c. board
F49	-01	☼	☼	☼			☼	☼	☼		Outdoor unit setting problem Abnormal setting of the outdoor p.c. board

If more than one error occurs between the indoor and outdoor units, the problem display on the remote controller may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

(※2)

LED7	LED8	Unit display for twin/triple system
		Master unit error
O		Slave unit 1 error
	O	Slave unit 2 error

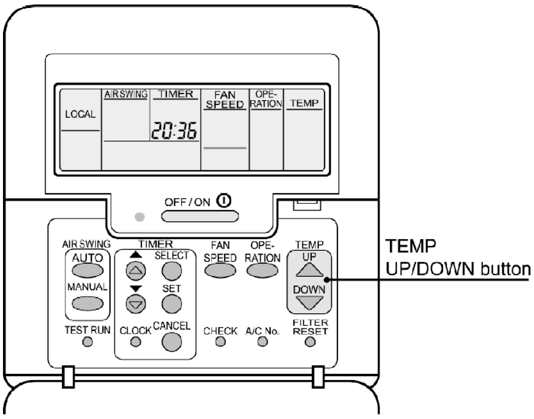
- The LED1 (green) illuminates to indicate that the microprocessor on the microprocessor circuit board is operating normally.
If the LED is switched off or is flashing irregularly, check the power supply, and turn it off and then on again.

23. SETTING OF SAVE ENERGY AND THERMISTOR SWITCH

23.1. Energy save setting

- Upper and lower limit can be set for the setting temperature during cooling and heating operation. (The factory shipment setting has

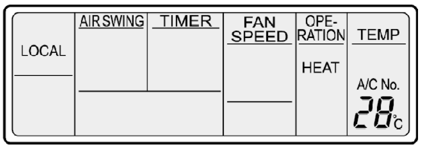
an upper limit of 31°C and a lower limit of 16°C.)


LOCAL
AIR SWING
TIMER
FAN SPEED
OPE-RATION
TEMP
20:36
OFF / ON
AUTO
MANUAL
SELECT
SET
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET
TEMP
UP/DOWN button

1. **While operation is stopped, press the TEMP UP and TEMP DOWN buttons simultaneously.**

The display will change.

(Example)

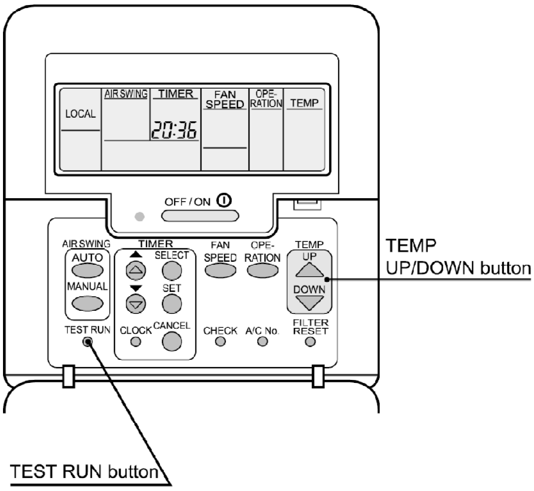

LOCAL
AIR SWING
TIMER
FAN SPEED
OPE-RATION
TEMP
HEAT
A/C No.
28°C

2. **To set an upper limit**
   Press the OPERATION button until HEAT is displayed. / ↓ / Press the TEMP UP or TEMP DOWN button to set the temperature. / ↓ / Press the SET button to complete the upper limit setting. / Example: / If the heating display is set to 28°C, setting the temperature to higher than 28°C will not be possible. / * Upper and lower limits cannot be set at the same time.
3. **To set a lower limit**
   Press the OPERATION button until COOL is displayed. / ↓ / Press the TEMP UP or TEMP DOWN button to set the temperature. / ↓ / Press the SET button to complete the lower limit setting. / Example: / If the cooling display is set to 22°C, setting the temperature to lower than 22°C will not be possible. / * Press the CANCEL button to cancel the setting.

23.2. Switching to the remote control thermistor

- The temperature detection thermistor used for detecting the indoor temperature can be switched between the thermistor at the indoor

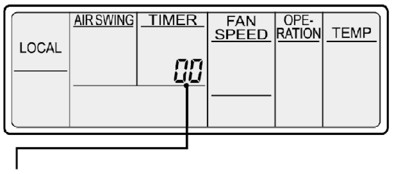
unit and the thermistor at the remote control unit. (The factory shipment setting is at the indoor unit side.)


LOCAL
AIR SWING
TIMER
FAN SPEED
OPE-RATION
TEMP
20:36
OFF / ON
AIR SWING
AUTO
MANUAL
TIMER
SELECT
SET
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CANCEL
CHECK
A/C No.
FILTER RESET
TEMP UP/DOWN button
TEST RUN button

1. **While operation is stopped, press and hold the TEST RUN button, TEMP UP button and TEMP DOWN button simultaneously.**

The time display on the timer display panel will change.

(Example)


LOCAL
AIR SWING
TIMER
FAN SPEED
OPE-RATION
TEMP
00

"00" ... Indoor unit temperature detection setting
"01" ... Remote control temperature detection setting

Press the FORWARD or BACK timer button to change the temperature detection setting.

2. **Press the SET button to complete the setting.
To change the setting, repeat the above operation.**

24. GROUP CONTROL

Setting group for 1 remote control unit

- **When using a remote control thermostat, the thermostat setting is used for all indoor units in the group.**
- **During group control, up to a maximum of 16 indoor units can be connected. (Do not mix heat pump units and cooling-only units.)**
- **Do not mix manual settings and automatic settings. (manual settings take priority.)**
- **The master unit and slave units can be centralized controlled during group control. /**

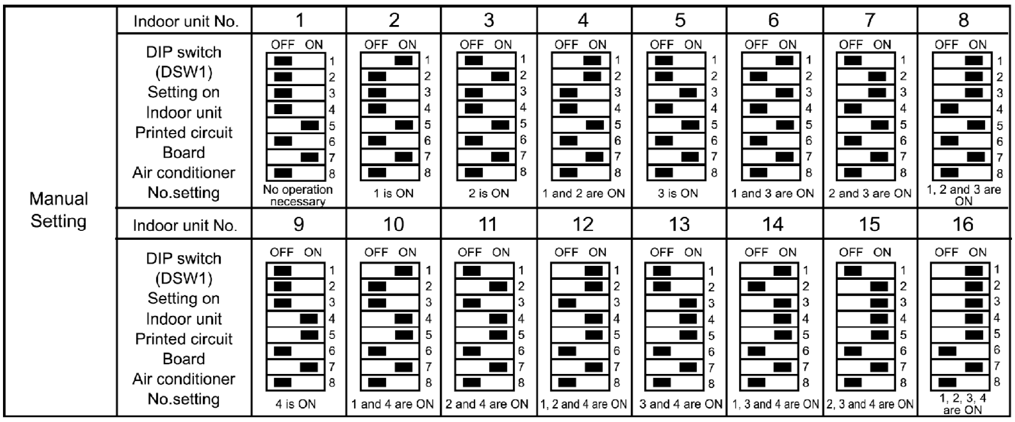
Automatic setting for group control

- **If the power supplies for indoor units which are connected are turned on simultaneously, the indoor unit numbers will be determined automatically after approximately 1 minute. (DIP switch settings are not necessary.) /**

NOTE:

- **Correct wiring connections are a basic requirement for automatic setting. If the wires are connected incorrectly when the power is turned on, the settings will not be made correctly and operation will not be possible.**
- **When address numbers are set automatically, you will not know which address number corresponds to which indoor unit.**
- **Do not turn off the power supply for at least 1 minute during automatic address setting, otherwise the settings will not be made correctly.**

(Manual setting for group control)



Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1) Setting on Indoor unit Printed circuit Board Air conditioner No.setting	No operation necessary	1 is ON	2 is ON	1 and 2 are ON	3 is ON	1 and 3 are ON	2 and 3 are ON	1, 2 and 3 are ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1) Setting on Indoor unit Printed circuit Board Air conditioner No.setting	4 is ON	1 and 4 are ON	2 and 4 are ON	1, 2 and 4 are ON	3 and 4 are ON	1, 3 and 4 are ON	2, 3 and 4 are ON	1, 2, 3, 4 are ON

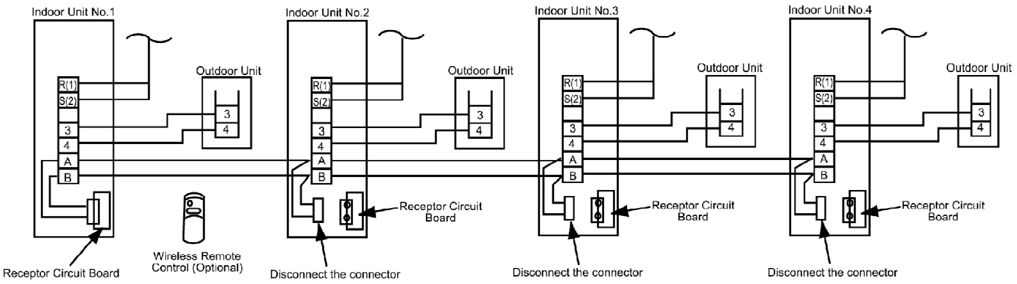
Automatic address resetting for group control

Set the DIP switches 1 to 4 to OFF and stop the operation. Then press the “AIR SWING AUTO” “OPERATION” and “Air conditioner No.” buttons simultaneously. Then addresses will be momentarily reset, and then automatic address setting will be carried out once more.

/

Note with regard to the Mini-cassette

When carrying out group control of a Mini-cassette system using a single wireless remote control, be sure to disconnect the connectors for all receptor circuit boards except the one for indoor unit. No. 1, before turning on the power. (The same action as for the slave units in twin and triple systems is necessary.)


Indoor Unit No.1
Indoor Unit No.2
Indoor Unit No.3
Indoor Unit No.4
Outdoor Unit
Outdoor Unit
Outdoor Unit
Outdoor Unit
R(1)
S(2)
3
4
A
B
3
4
Receptor Circuit Board
Wireless Remote Control (Optional)
Receptor Circuit Board
Receptor Circuit Board
Receptor Circuit Board
Disconnect the connector
Disconnect the connector
Disconnect the connector

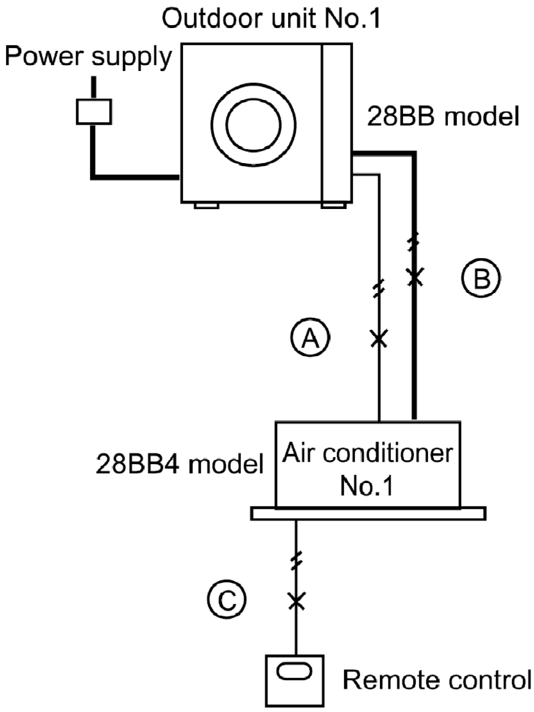
25. TROUBLESHOOTING

If test operation does not proceed correctly

Carry out test operation after approximately 12 hours have passed since the power was turned on (crankcase heater is energized). If operation is started by using the remote control within 1 minute of turning on the power, the outdoor unit settings will not be made correctly and correct operation will not be possible.

If the following symptoms occur after turning on the power, check the wiring connections once more. /

- For standard installation / (System example)

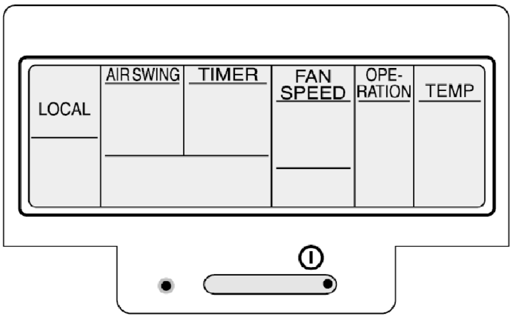

Outdoor unit No.1
Power supply
28BB model
Ⓑ
Ⓐ
28BB4 model
Air conditioner No.1
Ⓒ
Remote control

1. **The main power is turned on while the indoor-outdoor transmission wires are not connected (open circuit at section A) / Symptom: / Remote control unit... “CHECK” flashes / NOTE: / Indoor unit... LED2 on printed circuit board flashes / Outdoor**

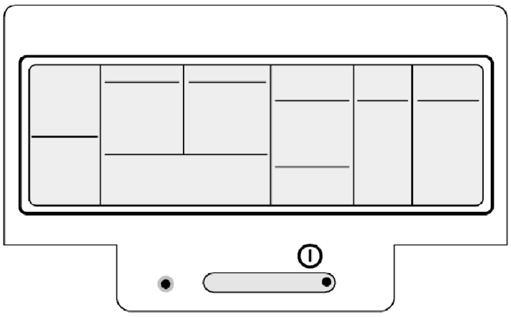
unit... LED3 and LED7 on printed circuit board flash /

2. **The main power is turned on while the indoor-outdoor power supply wires are not connected (open circuit at section B) / Symptom: / Remote control unit... Display of "No power supply" / NOTE: / Indoor unit... No display / Outdoor unit... LED3 and LED7 on printed circuit board flash /**
3. **The main power is turned on while the remote control unit connection cord is not connected (open circuit at section C) / Symptom: / Remote control unit... Display of "No power supply" / NOTE: / Indoor unit... LED1 on printed circuit board stays illuminated / Outdoor unit... LED1 on printed circuit board stays illuminated**

/ (When remote control display shows "Power supply")



(When remote control display shows "No power supply")



Remedy

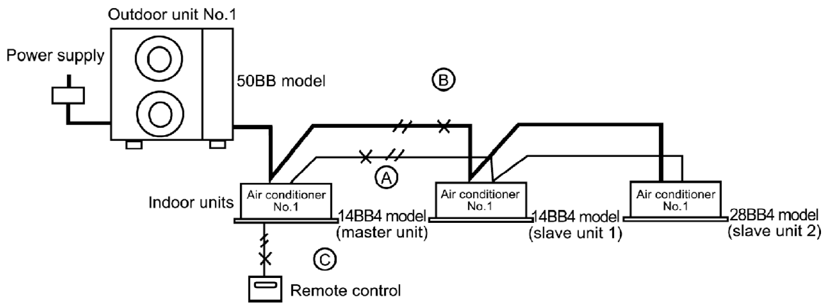
1. **Turn off the main power. / ↓**
2. **Connect the disconnected wire correctly. / ↓**
3. **Turn on the main power. / ↓**
4. **After 1 minute, start the operation using the remote control. / (Indoor unit operation will start according to the remote control setting.) / (Outdoor unit operation will start after 3-5 minutes.)**

NOTE:

The “CHECK” display on the remote control and the flashing of LEDs on the printed circuit boards will not occur immediately. They will appear 3-6 minutes after the main power is turned on.

- **During twin/triple operation**

(System example)


Outdoor unit No.1
Power supply
50BB model
Ⓑ
Ⓐ
Indoor units
Air conditioner No.1
14BB4 model (master unit)
Air conditioner No.1
14BB4 model (slave unit 1)
Air conditioner No.1
28BB4 model (slave unit 2)
Ⓒ
Remote control

1. **The main power is turned on while the transmission wires between the indoor unit(s) are not connected (open circuit at section A) / Symptom: / Nothing abnormal appears on the remote control display. If operation is started in this condition, the combination of the 50BB outdoor unit and the 14BB4 indoor unit (master unit) will result in abnormal operation. / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop.**

   - **Remote control... “CHECK” flashes**
   - **Indoor unit (master)... The LEDs on the printed circuit board flash and operation stops**
   - **Indoor unit (slave)... LED1 on the printed circuit board illuminates and the unit does not operate at all**
   - **Outdoor unit... The LEDs on the printed circuit board flash and operation stops**

2. **The main power is turned on while the power supply wires between the indoor unit(s) are not connected (open circuit at section B) / Symptom: / Same as above. If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop. / ↓**

   - **Remote control... “CHECK” flashes**
   - **Indoor unit (master)... The LEDs on the printed circuit board flash**
   - **Indoor unit (slave)... The LEDs on the printed circuit board do**

not illuminate and the unit does not operate at all

- **Outdoor unit... The LEDs on the printed circuit board flash and operation stops**

3. The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom:

- **Remote control unit.. . Display of "No power supply"**
- **Indoor unit (master)... LED1 on the printed circuit board stays illuminated and the unit does not operate**
- **Indoor unit (slave)... LED1 on the printed circuit board stays illuminated and the unit does not operate**
- **Outdoor unit... LED1 on the printed circuit board stays illuminated and the unit does not operate**

Remedy

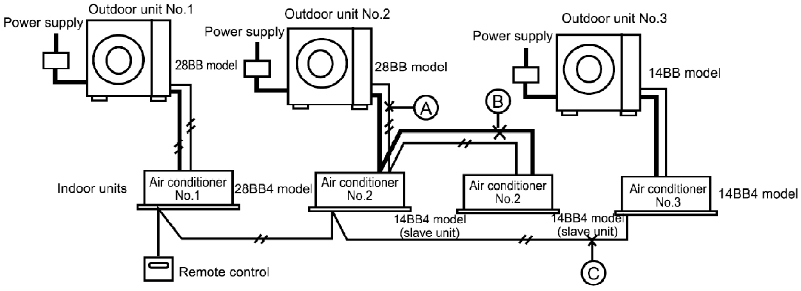
1. Turn off the main power. / ↓
2. Connect the disconnected wires correctly. / ↓
3. Turn on the main power. / ↓
4. After 1 minute, start the operation using the remote control. / (Indoor units' operation will start according to the remote control setting.) / (Outdoor unit operation will start after 3-5 minutes.)

/ If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

1. Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. / ↓
2. Press the ADDRESS RESET button (SW3) at the outdoor unit for approximately 4 seconds / (The self-diagnosis LEDs 2 to 8 will illuminate in order, and the system is reset once they are all illuminated.)

/ The above procedure cannot be used to carry out automatic address resetting during group control. /

- **During group control operation**
  (System example)


Outdoor unit No.1
Power supply
28BB model
Outdoor unit No.2
Power supply
28BB model
Outdoor unit No.3
Power supply
14BB model
A
B
Indoor units
Air conditioner No.1
28BB4 model
Air conditioner No.2
Air conditioner No.2
Air conditioner No.3
14BB4 model
14BB4 model (slave unit)
14BB4 model (slave unit)
Remote control
C

1. **The main power is turned on while the transmission wires between the indoor unit and the outdoor unit are not connected (open circuit at section A) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible. / However, "CHECK" flashes in the remote control display for 3-5 minutes after the main power is turned on.**

   - Remote control... "CHECK" flashes
   - Indoor unit No. 2... LED2 on the printed circuit board flashes (both master and slave units)
   - Outdoor unit No. 2... LED3 and LED7 on the printed circuit board flash
2. **The main power is turned on while the power supply wires between the indoor units are not connected (open circuit at section B) / Symptom: / Operation of indoor unit No. 1 and indoor unit No. 3 is possible / However, if operation is then started in this condition, the combination of the 28BB outdoor unit and the 14BB4 indoor unit (master unit) will result in abnormal operation of indoor unit No. 2. / ↓ / If operation continues, an abnormality will occur on the refrigeration cycle and operation will stop**

   - Remote control... "CHECK" flashes (indoor unit No. 2 abnormality)
   - Indoor unit No. 2... LED2 on the printed circuit board flashes (both master and slave units)
   - Outdoor unit No. 2... The LEDs on the printed circuit board flash
3. **The main power is turned on while the remote control connection cord is not connected (open circuit at section C) / Symptom: /**

Nothing abnormal appears on the remote control display, and operation of indoor unit. No. 1 and indoor unit No. 2 is possible. / However, indoor unit No. 3 cannot be operated.

- Remedy

1. **Turn off the main power. /** ↓
2. **Connect the disconnected wires correctly. /** ↓
3. **Turn on the main power. /** ↓
4. **After 1 minute, start the operation using the remote control. / (Indoor units' operation will start according to the remote control setting.) / (Outdoor units' operation will start after 3-5 minutes.) /**

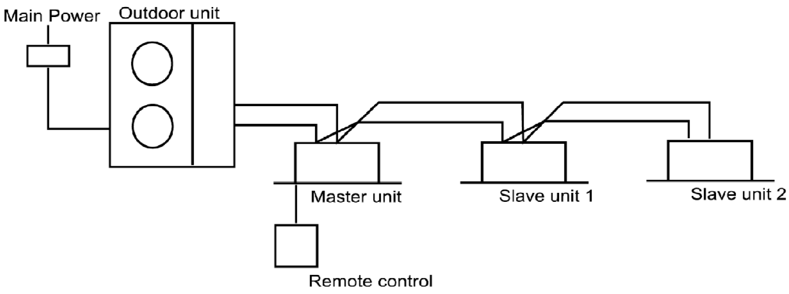
If slave units do not operate even after the wiring has been corrected (automatic addressing is not possible)

1. **Check that DIP switches 1 to 4 and DIP switch 8 are all set to OFF, and then stop operation. /** ↓
2. **Press the "AIRSWING AUTO", "OPERATION" and "A/C No." buttons simultaneously. / The addresses will be momentarily reset, and then automatic address setting will be carried out once more.**

/ The above procedure cannot be used to carry out automatic address resetting of twin/triple control. / / (Note on automatic address setting) / The printed circuit boards automatically store the connected system configuration when power is supplied. As a result, once the power has been turned on for these printed circuit boards, the units can not be changed about within the system, even if the units are of the same model and have same capacity.

- **Address setting for twin/triple system**

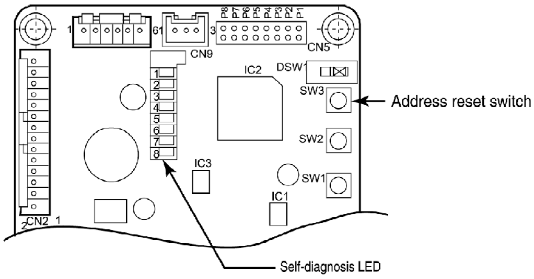
(Example)



1. **Automatic address setting (don't need to set dip-switch) / If the wiring is connected properly as above example, the address is set automatically by the main power supply. An indoor unit with**

remote control will be set as the master. If the power source is installed to indoor units and outdoor units separately, turn on the switch by following the procedure: outdoor unit, then indoor unit with control, and finally other indoor units.

When the slave units do not operate (when address cannot be set) /


P8
P7
P6
P5
P4
P3
P2
P1
1
6
1
3
CN9
CN5
IC2
DSW1
SW3
Address reset switch
1
2
3
4
5
6
7
8
SW2
IC3
SW1
IC1
CN2
2
1
Self-diagnosis LED

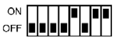
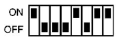
Reset the address by following the procedure:

A. After making sure that dip-switches No. 1 to 4 and No. 8 are OFF, stop the operation.

B. Push address reset button (SW3) on the outdoor unit PC board for 4 seconds. Self-diagnosis LED No. 2 to 8 will start blinking in order. And when all 7 pieces of LEDs (No. 2 ~ 8) are illuminated, the address for the slave unit has been reset.

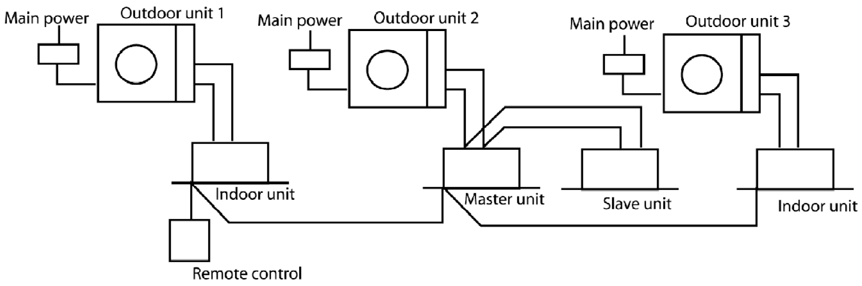
Important: **The address for the group control cannot be reset, using the above mentioned procedure.**

2. Manual address setting (by dip-switch DSW1) / When setting the address manually, set the dip-switch of the PC board of the indoor unit as follows:

Master Unit	Slave unit (Slave No.1 of Triple)	Slave unit (Slave No.2 of Triple)
The unit with the wired remote control or the ray receiver connected will be the master unit.	DSW1  No. 8 ON, The other no change	 No. 1 and 8 ON, The other no change

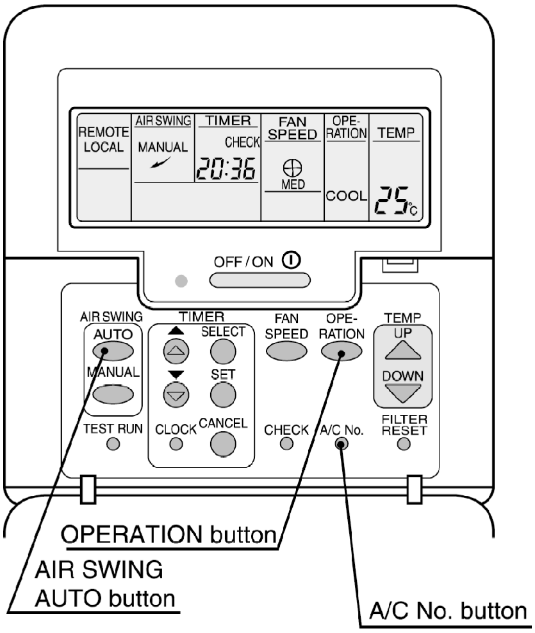
● **Address setting for group control system**

(Example)


Main power
Outdoor unit 1
Main power
Outdoor unit 2
Main power
Outdoor unit 3
Indoor unit
Master unit
Slave unit
Indoor unit
Remote control

1. **Automatic address setting (don’t need to set dip-switch) / If the wiring is connected properly as above example, the AC numbers are set automatically by the main power supply. An indoor unit with remote control will be set as the master. / If the power source is installed to indoor units and outdoor units separately, turn on the switch by following the procedure: outdoor unit, then indoor unit with control, and finally other indoor units. The AC number will be set at random.**

   When the slave units do not operate (when address cannot be set)


REMOTE
LOCAL
AIR SWING
MANUAL
TIMER
CHECK
20:36
FAN SPEED
MED
OPE-RATION
COOL
TEMP
25°C
OFF / ON
AIR SWING
AUTO
MANUAL
TIMER
SELECT
SET
CANCEL
FAN SPEED
OPE-RATION
TEMP
UP
DOWN
TEST RUN
CLOCK
CHECK
A/C No.
FILTER RESET
OPERATION button
AIR SWING AUTO button
A/C No. button

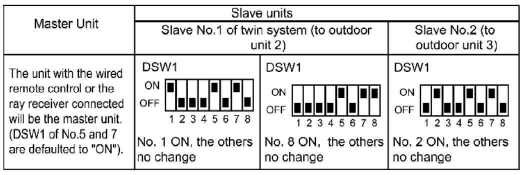
   Reset the address by following the procedure:

   A. Make sure that dip-switches No. 1 to 4 and No. 8 are OFF, stop the operation.

   B. Simultaneously, push buttons “AIR SWING AUTO”, “OPERATION” and “A/C No.”. The address will be reset and new address will be set.

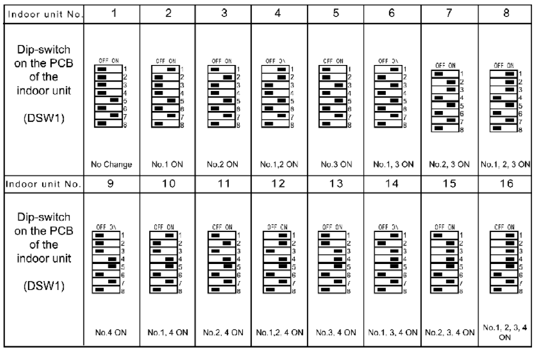
Important: **The address for the Twin/Triple control cannot be reset, using the above mentioned procedure.**

2. Manual address setting (by dip-switch DSW1) / When setting the address manually, set the dip-switch of the PC board of the indoor unit as follows:



Master Unit	Slave units		
	Slave No.1 of twin system (to outdoor unit 2)		Slave No.2 (to outdoor unit 3)
The unit with the wired remote control or the ray receiver connected will be the master unit. (DSW1 of No.5 and 7 are defaulted to "ON").	DSW1 ON OFF 1 2 3 4 5 6 7 8 No. 1 ON, the others no change	DSW1 ON OFF 1 2 3 4 5 6 7 8 No. 8 ON, the others no change	DSW1 ON OFF 1 2 3 4 5 6 7 8 No. 2 ON, the others no change

3. Manual address setting (by dip-switch DSW1) / When setting the address manually, set the dip-switch of the PC board in the indoor unit as follows:



Indoor unit No.	1	2	3	4	5	6	7	8
Dip-switch on the PCB of the indoor unit (DSW1)	No Change	No.1 ON	No.2 ON	No.1,2 ON	No.3 ON	No.1, 3 ON	No.2, 3 ON	No.1, 2, 3 ON
Indoor unit No.	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Dip-switch on the PCB of the indoor unit (DSW1)	No.4 ON	No.1, 4 ON	No.2, 4 ON	No.1,2, 4 ON	No.3, 4 ON	No.1, 3, 4 ON	No.2, 3, 4 ON	No.1, 2, 3, 4 ON

Procedures of deleting memory for twin/triple control system

1. **Switch off the main power supply.**
2. **Set the No. 8 pin of dip switch (DSW1) at the indoor unit’s P.C. board to “ON” position.**
3. **Switch on the main power supply for a minute and then turn it off.**
4. **Set the No. 8 pin of dip switch (DSW1) to “OFF” position.**

Procedures of deleting memory for group control system

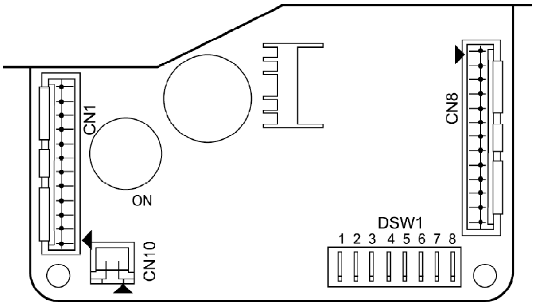
1. **Switch off the main power supply.**
2. **Set the No. 1 until No. 4 pin of dip switch (DSW1) at the indoor unit’s P.C. board to “ON” position. / (Make sure No. 8 pin of dip switch (DSW1) is at “OFF” position)**
3. **Switch on the main power supply for a minute and then turn it off.**
4. **Set the No. 1 pin until No. 4 pin of dip switch (DSW1) to “OFF”**

position.

(Important notice) / Above procedures are meant for deleting memory on indoor unit’s P.C. board. And it is not for Address reset.

Indoor unit P.C. board layout

Below drawing shows the location of dip switch 1 (DSW1) on the indoor unit P.C. board.



Dip switch 1 (DSW1). [to be used for manual setting]

26. EMERGENCY OPERATION

Emergency operation

- **Emergency operation of outdoor unit / Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board of the outdoor unit to the EMERGENCY position. However, emergency operation is only carried out when an abnormality is detected by the indoor/outdoor temperature thermistors. / The resistance values of each thermistor are measured as shown in the table below to determine if there is an abnormality. / / Thermistor resistance table**

Temperature	Resistance value (kΩ) ± 5%	
	Room temperature thermistor	Pipe temperature thermistor
-20°C	205.8	197.8
-10°C	114.6	111.9
-5°C	87.3	85.4
0°C	67.0	65.8
5°C	51.8	51.0
10°C	40.4	39.9
15°C	31.7	30.7
20°C	25.1	25.0
25°C	20.0	20.0
30°C	16.1	16.0
40°C	10.4	10.6
50°C	6.9	7.1
60°C	4.7	4.9
70°C	----	3.5
80°C	----	2.5
90°C	----	1.8
100°C	----	1.4

The pipe temperature thermistor resistance value are the same for the indoor and outdoor units.

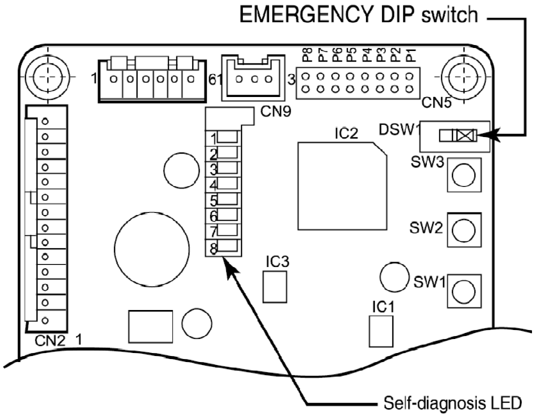
<When a thermistor abnormality is judged to have occurred>

- Set only the thermistor which shows an abnormality to the condition as shown in the table below to carry out emergency operation.

	Thermistor	Cooling mode	Heating mode
Indoor unit	Room temperature	Fixed at 25°C	
	Pipe temperature	Shorted	Open

	Thermistor	Cooling mode	Heating mode
Outdoor unit	Discharge temperature	Open	Shorted
	Heat exchanger outlet temperature	Shorted	Open

- **Refer to the circuit diagram for the connection locations for each thermistor.**
- **If there is an abnormality in the room temperature thermistor, the temperature will be fixed at 25°C regardless of the remote control display.**


EMERGENCY DIP switch
P8
P7
P6
P5
P4
P3
P2
P1
1
6
1
3
CN9
CN5
IC2
DSW1
SW3
SW2
SW1
1
2
3
4
5
6
7
8
IC3
IC1
CN2
1
Self-diagnosis LED

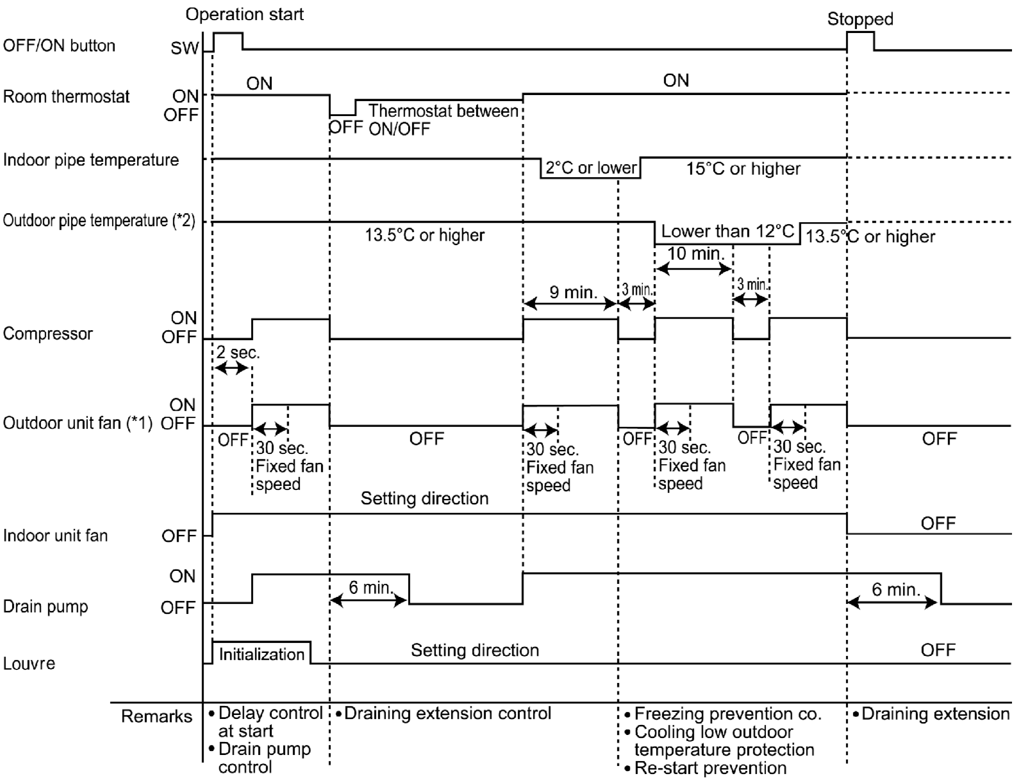
NOTE:

- **Any abnormalities detected by the temperature thermistors are ignored during emergency operation, therefore, long-term operation in this mode should be avoided.**
- **After emergency mode operation has been completed and normal operation is to be resumed, turn off the power supplies for the indoor and outdoor units and set the DSW1 switch to NORMAL position.**
- **Self-diagnosis LEDs 4 to 6 will flash during emergency operation.**

27. CONTROL

Description of basic Functions

27.1. Cooling mode operation time chart


Operation start
Stopped
OFF/ON button
SW
Room thermostat
ON
OFF
ON
Thermostat between
OFF ON/OFF
ON
Indoor pipe temperature
2°C or lower
15°C or higher
Outdoor pipe temperature (*2)
13.5°C or higher
Lower than 12°C
13.5°C or higher
10 min.
9 min.
3 min.
3 min.
Compressor
ON
OFF
2 sec.
Outdoor unit fan (*1)
ON
OFF
OFF
30 sec.
Fixed fan
speed
OFF
Setting direction
30 sec.
Fixed fan
speed
OFF
30 sec.
Fixed fan
speed
OFF
30 sec.
Fixed fan
speed
OFF
Indoor unit fan
OFF
OFF
Drain pump
ON
OFF
6 min.
6 min.
Louvre
Initialization
Setting direction
OFF
Remarks
• Delay control at start
• Drain pump control
• Draining extension control
• Freezing prevention co.
• Cooling low outdoor temperature protection
• Re-start prevention
• Draining extension

(*1) / Outdoor unit fan start control during cooling / At the start of cooling mode and drying mode operation, the outdoor unit heat exchanger outlet temperature is detected in order to set the fan speed. / Operation is carried out at the fan speed detected for 30 seconds.

Heat exchanger outlet temperature detected (T)	Outdoor unit fan start speed
T < 0°C	SUPER LOW
0°C ≦ T < 10°C	LOW
10°C ≦ T < 20°C	MEDIUM
20°C ≦ T < 25°C	HIGH
25°C ≦ T	SUPER HIGH

After 30 seconds, the heat exchanger outlet temperature is detected and the outdoor unit fan speed is changed automatically.
(*2) / Cooling low outdoor temperature protection / When the outlet temperature of the heat exchanger drops to less than 12°C for a continuous period of 10 minutes, the outdoor unit stops. / This is cancelled after 3 minutes (re-start prevention)

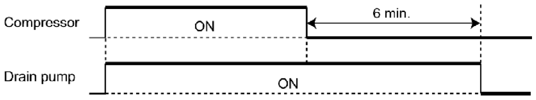
- **Remote control displays and indoor unit operation continue during this time.**
- **The 10 minutes countdown is cleared if the compressor stops or if the temperature at the outdoor unit outlet rises to 13.5°C or higher.**

27.2. Drain pump control

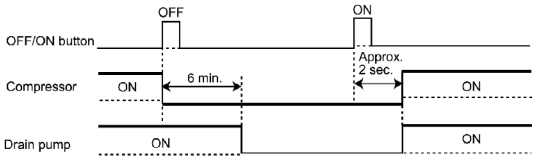
1. Basic operation / During cooling mode, dry mode or defrost mode

operation, the drain pump turns on when the compressor turns on. (The drain pump turns on during freezing prevention control.)

- **When the compressor turns off, the drain pump will still continue its operation for 6 more minutes.**


Compressor
ON
6 min.
Drain pump
ON

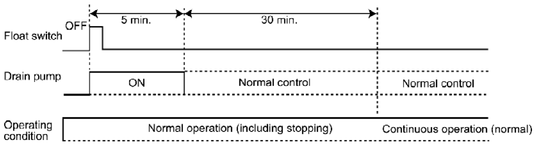
- **If the drain pump is running when operation stops or when the operating mode is changed, the drain pump will still continue its operation for 6 more minutes.**


OFF
ON
OFF/ON button
Approx. 2 sec.
Compressor
ON
6 min.
ON
Drain pump
ON
ON

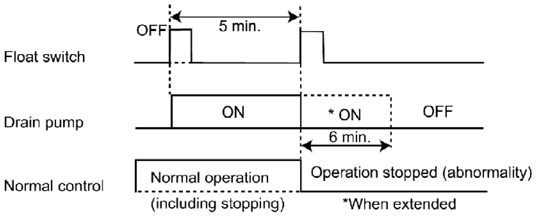
2. Drain water problems

A. Starting / If it is detected that the float switch is off, the drain pump turns on for 5 minutes. If the float switch is still found to be off after these 5 minutes have passed, or if the float switch is found to turn off twice during another 30 minutes period, a drain water error will be generated.

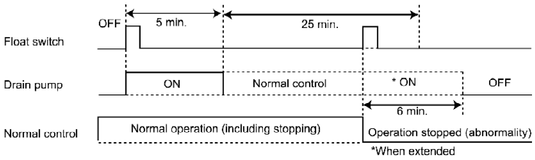
B. Normal operation / After extension control (louvre initialization and pre-heating cancel), the indoor units and outdoor units stop running. LED2 on the indoor unit self-diagnosis LED panel will flash, and "CHECK" will appear on the wired remote control display. / The error code (F15-01) can be displayed by pressing the CHECK button. / When the wireless remote control is being used, the OPERATION indicator on the ray receiver will flash. / / <If the float switch does not operate again after turning off>


5 min.
30 min.
OFF
Float switch
Drain pump
ON
Normal control
Normal control
Operating condition
Normal operation (including stopping)
Continuous operation (normal)

(When float switch is continuously off)

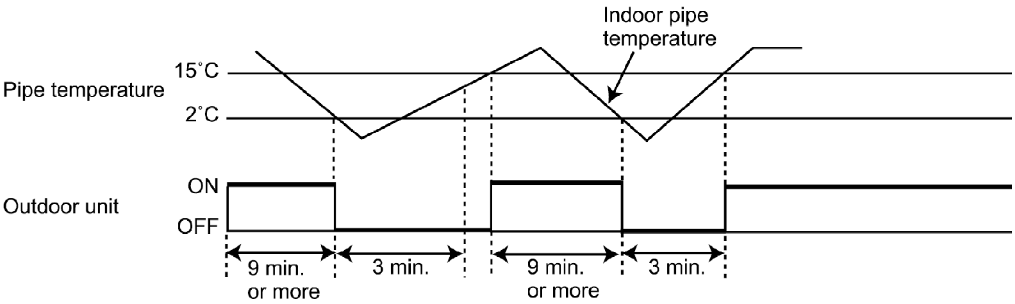

OFF
5 min.
Float switch
Drain pump
ON
* ON
OFF
6 min.
Normal control
Normal operation
(including stopping)
Operation stopped (abnormality)
*When extended

<If the float switch operates again after turning off> / <If the float switch continues to be off>


OFF
5 min.
25 min.
Float switch
Drain pump
ON
Normal control
* ON
OFF
6 min.
Normal control
Normal operation (including stopping)
Operation stopped (abnormality)
*When extended

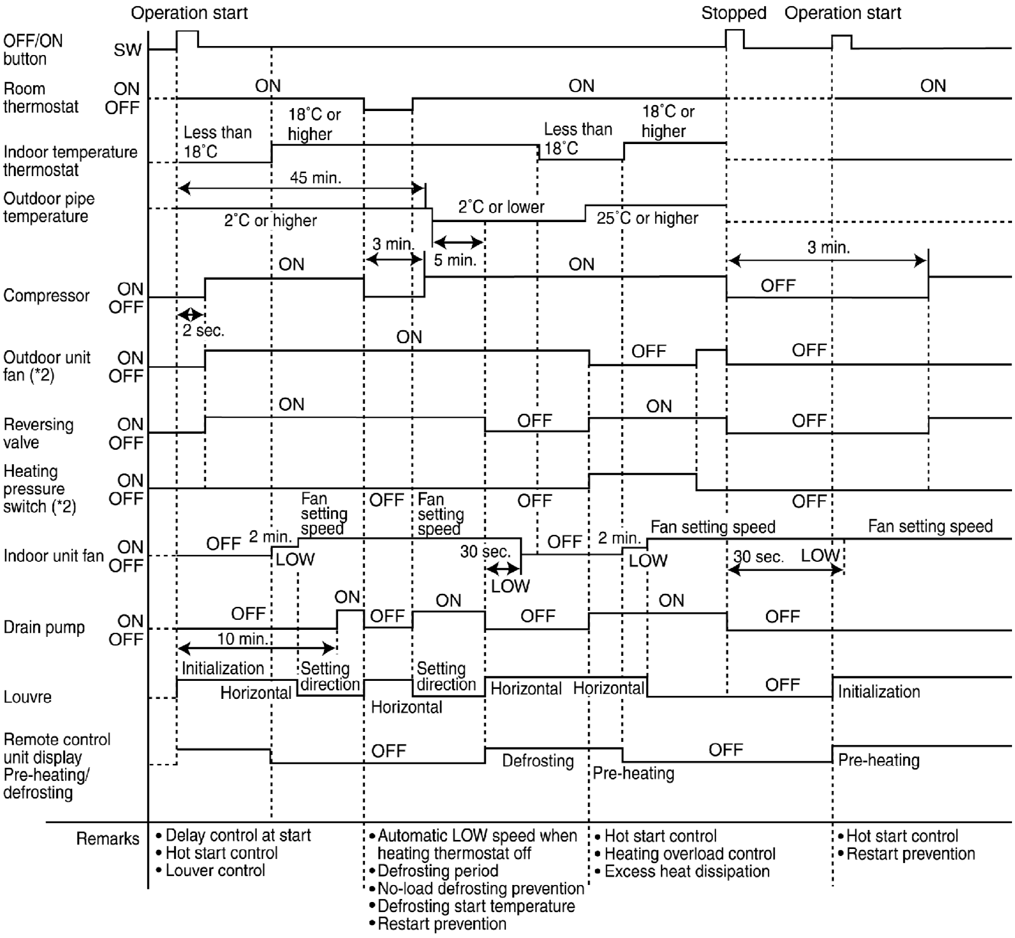
27.3. Freezing prevention control

1. Operation / During cooling mode operation, after 9 minutes have passed since the compressor turned on, the outdoor unit will stop its operation when the temperature detected by the indoor unit pipe temperature sensor is 2°C or lower. / The indoor unit continues operating at the fan speed set by the remote control. (The remote control display does not change.)
2. Cancelling / This control is cancelled when the temperature detected by the indoor unit pipe temperature sensor is 15°C or higher, however 3 minutes waiting of prevention control is necessary. / (The 9 minutes countdown is cleared while the compressor is stopped.)


Indoor pipe temperature
Pipe temperature
15˚C
2˚C
ON
Outdoor unit
OFF
9 min. or more
3 min.
9 min. or more
3 min.

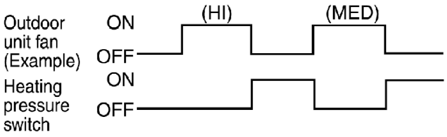
(The above illustration only shows the operation stops due to freezing prevention control of the indoor pipe temperature sensor.)

27.4. Heating mode operation time chart (Heat pump type)


Operation start
Stopped
Operation start
OFF/ON button
SW
Room thermostat
ON
OFF
ON
ON
ON
18˚C or higher
Less than 18˚C
Less than 18˚C
18˚C or higher
Indoor temperature thermostat
45 min.
Outdoor pipe temperature
2˚C or higher
2˚C or lower
25˚C or higher
3 min.
5 min.
3 min.
Compressor
ON
OFF
ON
ON
OFF
2 sec.
Outdoor unit fan (*2)
ON
OFF
ON
OFF
OFF
Reversing valve
ON
OFF
ON
OFF
ON
OFF
Heating pressure switch (*2)
ON
OFF
Indoor unit fan
ON
OFF
OFF
2 min.
Fan setting speed
LOW
OFF
Fan setting speed
30 sec.
LOW
OFF
OFF
2 min.
LOW
Fan setting speed
OFF
30 sec.
LOW
Fan setting speed
Drain pump
ON
OFF
OFF
10 min.
ON
OFF
ON
OFF
ON
OFF
Louvre
Initialization
Horizontal
Setting direction
Setting direction
Horizontal
Horizontal
Horizontal
OFF
Initialization
Remote control unit display Pre-heating/ defrosting
OFF
Defrosting
Pre-heating
OFF
Pre-heating
Remarks
• Delay control at start
• Hot start control
• Louver control
• Automatic LOW speed when heating thermostat off
• Defrosting period
• No-load defrosting prevention
• Defrosting start temperature
• Restart prevention
• Hot start control
• Heating overload control
• Excess heat dissipation
• Hot start control
• Restart prevention

(*2) / Outdoor unit fan control during heating mode operation / When the compressor is on during heating mode operation (except during defrosting and when the liquid bypass valve is on), the outdoor unit fan is controlled by means of input (CN2) indicating whether the contact of the heating pressure switch on the outdoor unit circuit board is open or closed. / (At the start of heating mode operation, the fan operates at HI speed.)

Heating pressure switch contact	Outdoor unit fan operation
ON (open) - OFF (closed)	One step down from fan speed before stopping
ON (open)	Stopped


Outdoor unit fan (Example)
ON
OFF
(HI)
(MED)
Heating pressure switch
ON
OFF

The heating pressure switch turns on at 2.35 MPa and off at 1.96 MPa.

27.5. Hot starting

1. When heating mode operation starts

A. Start

Hot start control commences when heating mode operation starts.

B. Operation

“PREHEAT” appears on the remote control display. (Other displays remain unchanged.) / The indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal

position (angle 0°).

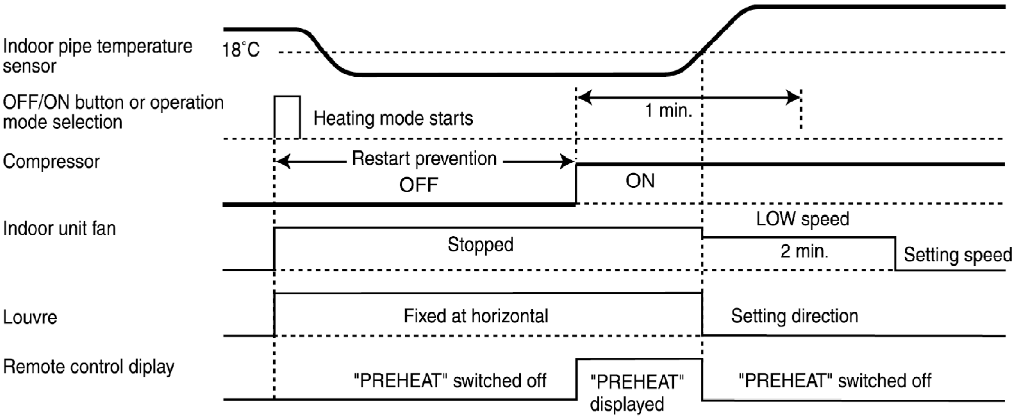
C. Cancelling

Hot starting will be cancelled when the compressor is turned on or the indoor unit pipe temperature sensor is 18°C or higher or after 1 minute of operation.

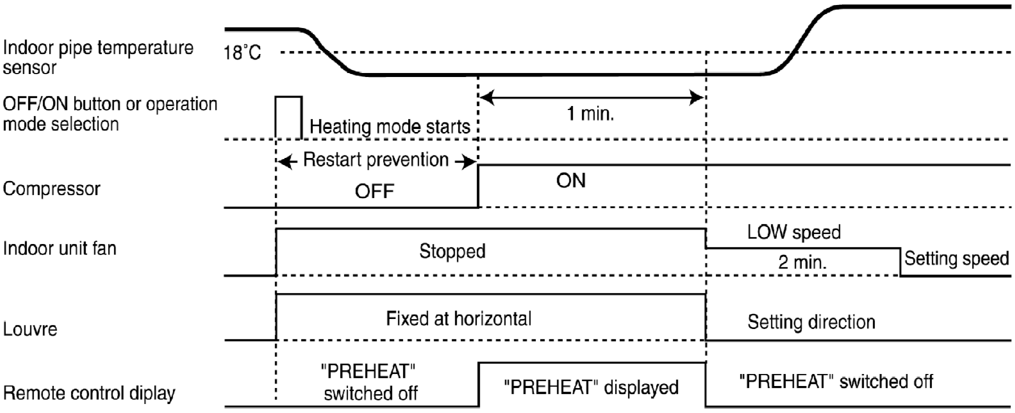
After cancellation, the “PREHEAT” display on the remote control disappears and the louvre operation returns to the previous setting.

(However, for 2 minutes after cancellation, the indoor unit fan operates at LOW speed, and then returns to the previous setting.)

<When hot start operation is cancelled by temperature>


Indoor pipe temperature sensor
18°C
OFF/ON button or operation mode selection
Heating mode starts
1 min.
Compressor
Restart prevention
OFF
ON
Indoor unit fan
Stopped
LOW speed
2 min.
Setting speed
Louvre
Fixed at horizontal
Setting direction
Remote control diplay
"PREHEAT" switched off
"PREHEAT" displayed
"PREHEAT" switched off

<When hot start operation is cancelled by time>


Indoor pipe temperature sensor
18°C
OFF/ON button or operation mode selection
Heating mode starts
1 min.
Restart prevention
Compressor
OFF
ON
Indoor unit fan
Stopped
LOW speed
2 min.
Setting speed
Louvre
Fixed at horizontal
Setting direction
Remote control diplay
"PREHEAT" switched off
"PREHEAT" displayed
"PREHEAT" switched off

2. When defrosting is completed

A. Start

Hot start control commences when defrosting is completed.

B. Operation

“PREHEAT” appears on the remote control display. (Other displays remain unchanged)

The indoor unit fan stops. In addition, during hot starting, the louvre stays at the horizontal position (angle 0°C).

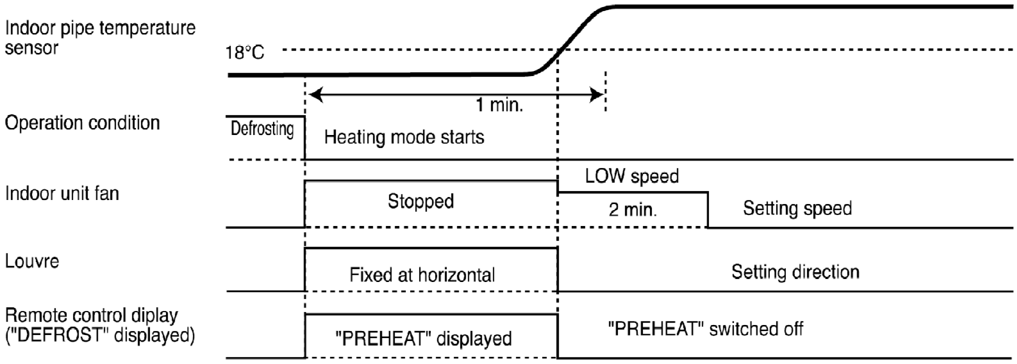
C. Cancelling

Hot starting will be cancelled when the temperature detected by the indoor unit pipe temperature sensor is 18°C or higher, or after a maximum 1 minute has passed since defrosting was completed.

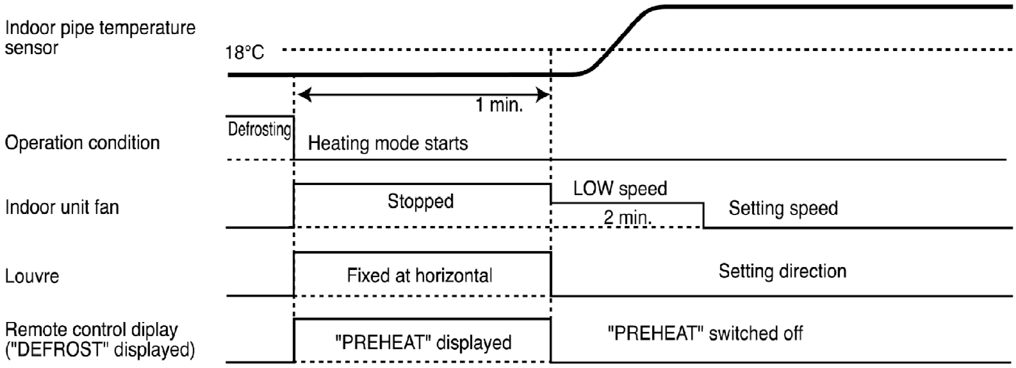
After cancellation, the "PREHEAT" display on the remote control disappears and the louvre operation returns to the previous setting.

(However, the indoor unit fan operates at LOW speed for 2 minutes after cancellation, and then returns to the previous setting.)

<When hot start operation is cancelled by temperature>

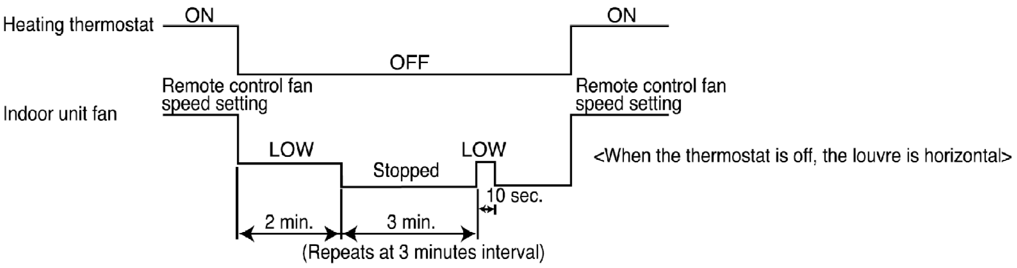

Indoor pipe temperature sensor
18°C
1 min.
Operation condition
Defrosting
Heating mode starts
Indoor unit fan
Stopped
LOW speed
2 min.
Setting speed
Louvre
Fixed at horizontal
Setting direction
Remote control diplay ("DEFROST" displayed)
"PREHEAT" displayed
"PREHEAT" switched off

<When hot start operation is cancelled by time>


Indoor pipe temperature sensor
18°C
1 min.
Operation condition
Defrosting
Heating mode starts
Indoor unit fan
Stopped
LOW speed
2 min.
Setting speed
Louvre
Fixed at horizontal
Setting direction
Remote control diplay ("DEFROST" displayed)
"PREHEAT" displayed
"PREHEAT" switched off

27.6. Indoor unit fan control when thermostat is off during heating mode operation

When the thermostat of the indoor unit turns off during heating mode operation, the indoor unit fan operates for 2 minutes at LOW and then stops. In addition, 5 minutes after the thermostat of the indoor unit turns off, the indoor unit fan operates at LOW for 10 seconds, and at 3 minutes interval after that, it switches back to LOW operation for another 10 seconds.


Heating thermostat
ON
OFF
ON
Indoor unit fan
Remote control fan speed setting
LOW
Stopped
LOW
Remote control fan speed setting
<When the thermostat is off, the louvre is horizontal>
10 sec.
2 min.
3 min.
(Repeats at 3 minutes interval)

27.7. Excess heat dissipation for indoor unit

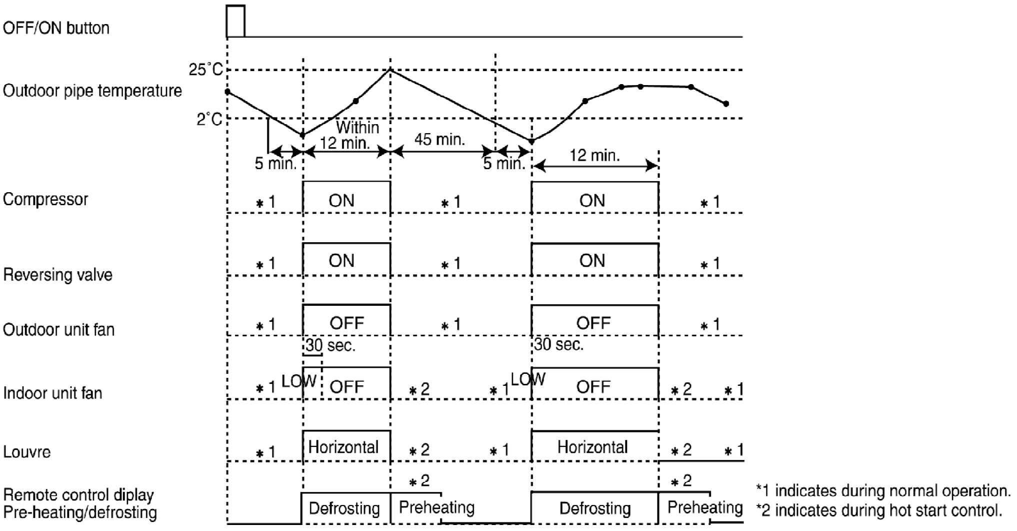
The indoor unit fan continue its operation for 30 seconds after heating mode operation turns off in order to dissipate excess heat.

1. When heating mode operation has stopped (LOW speed for 30 seconds)

2. When operation is set to a mode other than heating by means of the OPERATION button

3. If operation starts again during the 30 seconds mentioned at (1) (The fan operates at LOW speed for the remainder of the 30 seconds and then hot start commences.)

27.8. Defrost mode operation time chart


OFF/ON button
Outdoor pipe temperature
25˚C
2˚C
5 min.
Within 12 min.
45 min.
5 min.
12 min.
Compressor
＊1
ON
＊1
ON
＊1
Reversing valve
＊1
ON
＊1
ON
＊1
Outdoor unit fan
＊1
OFF
＊1
OFF
＊1
30 sec.
30 sec.
Indoor unit fan
＊1
LOW
OFF
＊2
＊1
LOW
OFF
＊2
＊1
Louvre
＊1
Horizontal
＊2
＊1
Horizontal
＊2
＊1
Remote control diplay Pre-heating/defrosting
Defrosting
＊2
Preheating
Defrosting
＊2
Preheating
*1 indicates during normal operation.
*2 indicates during hot start control.

1. Start and completion of defrosting

A. Start

During heating mode operation (including automatic heating), after the 45 minutes of defrosting cycle time has passed, defrosting starts if the temperature detected by the outdoor unit heat exchanger outlet sensor is 2°C or lower continuously for 5 minutes.

However, if the outdoor unit fan is stopped, the start of defrosting will be delayed by 5 minutes.

Then, the defrosting cycle will be 50 minutes from the start of heating mode operation.

B. Completion

Defrosting mode operation will stop if the outdoor unit heat exchanger outlet sensor is 25°C or higher or after 12 minutes of operation.

C. Forced defrosting

If P8 on the outdoor unit circuit board is shorted while the compressor is on during heating mode operation and the temperature detected by the outdoor unit heat exchanger outlet sensor is 25°C or lower, defrosting is carried out regardless of the current starting conditions.

2. Operation

A. During defrosting, the outdoor unit turns on the compressor and turns off the outdoor unit fan and the reversing valve.

B. The indoor unit fan operates at LOW speed for 30 seconds upon defrosting starts, After this, the indoor unit fan turns off until defrosting is completed.

(During defrosting, the louvre of the indoor unit stays at horizontal position).

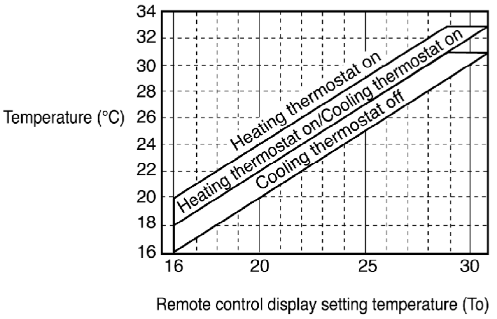
27.9. Indoor thermostat charateristics

1. Thermostat characteristics during cooling and heating modes.

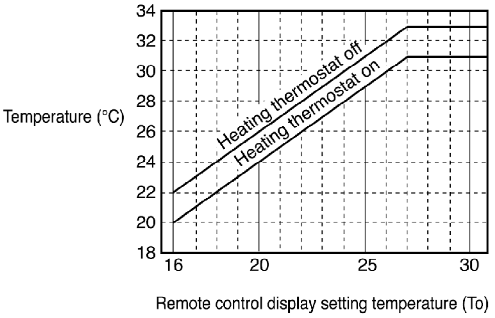
Operation mode	Setting temperature (To)	Room temperature (°C)		
		Operation	Differential	
			2.0K	4.0K
Cooling	16	O N	18.0	____
		O F F	16.0	____
	31	O N	33.0	____
		O F F	31.0	____
Heating *1	16	O N	18.0	20.0
		O F F	20.0	22.0
	29~31 *1 (27~31)	O N	31.0	31.0
		O F F	33.0	33.0

1* If jumper wire J3 on the indoor unit circuit board is disconnected, the thermostat characteristics during heating become 2K or higher.

Thermostat characteristics during cooling and heating modes



Thermostat characteristics during heating mode (when jumper wire J3 is disconnected)



NOTE: If the remote control display setting temperature (To) is 29°C or higher, the heating thermostat turns on when the room temperature is 31°C.

2. Thermostat characteristics during dry mode.

During dry mode operation, cooling mode operation is carried out in accordance with the indoor temperature as shown in the table below.

Mode	Indoor Temperature (°C) T	Operation details	
1	T ≧ 28	Cooling thermostat on	LO, Louvre horizontal
2	28 > T ≧ 25	Cooling thermostat on 10 min./fan 5 min., alternate operation	LO, Louvre horizontal
3	25 > T ≧ 21	Cooling thermostat on 5 min./fan 10 min., alternate operation	LO, Louvre horizontal
4	21 > T	Cooling thermostat off	LO, Louvre horizontal

(Differential is 1.5 K)

*** When modes (2) and (3) are active, dry mode operation starts when the cooling thermostat turns on.**
When modes (2) and (3) have been stopped, the 10 min./5 min. times have no relevance.
However, if the indoor temperature is less than or equal to the remote control unit setting temperature, mode (4) is forcibly activated.

3. Thermostat characteristics during automatic changeover operation

A. Settings at the start of automatic changeover operation

When operation changes from other modes to automatic changeover mode, operation starts at the temperature characteristics given in the table below.

Indoor Temperature (T) °C	Initial setting
T < remote control display temperature -2 (°C)	Heating mode operation, thermostat on
Remote control display temperature ≥ T	Heating mode operation, thermostat off (fan mode operation)
Remote control display temperature ≤ T	Cooling mode operation, thermostat off (fan mode operation)
Remote control display temperature +2 (°C) < T	Cooling mode operation, thermostat on

2 (°C): Thermostat differential

B. Thermostat characteristic when switching between cooling and heating mode operation

Switching between cooling mode and heating mode operation is carried out as shown in the table below.

However, during automatic changeover operation, the operation will not change within 10 minutes after the thermostat has switched off, either cooling mode or heating mode.

(The 10 minutes timer will be cancelled when operation is changed to other modes (manually) or when operation stops and the thermostat turns on.)

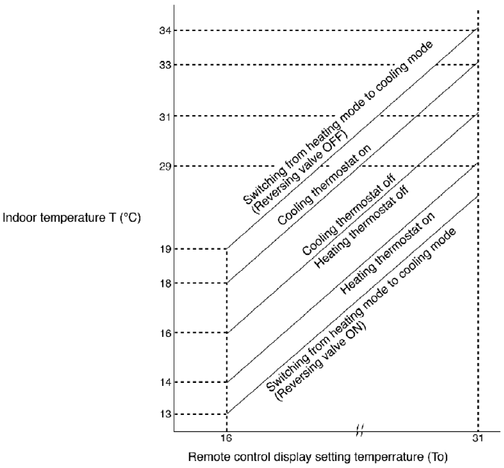
Indoor Temperature (T) °C	Operation switching
T ≥ Remote control display temperature +3 (°C)	Heating mode → Cooling mode
T ≤ Remote control display temperature -3 (°C)	Cooling mode → Heating mode

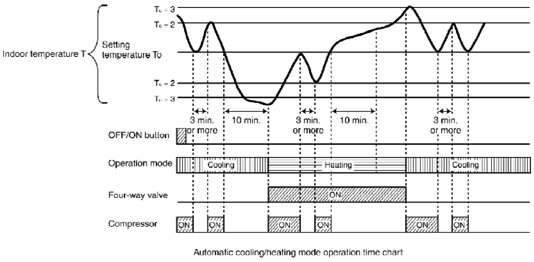
C. Thermostat characteristics during cooling mode and heating operation

The thermostat on/off characteristics in both operation modes are given in the table below.

Operation mode	Indoor Temperature (°C) T	Operation
Cooling mode	T > Remote control display temperature +2 (°C)	Cooling thermostat on
	T ≤ Remote control display temperature	Cooling thermostat off
Heating mode	T < Remote control display temperature -2 (°C)	Cooling thermostat on
	T ≥ Remote control display temperature	Cooling thermostat off

Indoor temperature thermostat characteristics during automatic changeover operation




Indoor temperature T
Setting temperature To
To + 3
To + 2
To - 2
To - 3
3 min. or more
10 min.
3 min. or more
10 min.
3 min. or more
OFF/ON button
Operation mode
Cooling
Heating
Cooling
Four-way valve
ON
Compressor
ON
ON
ON
ON
ON
ON

Automatic cooling/heating mode operation time chart

27.10. Indoor unit fan control

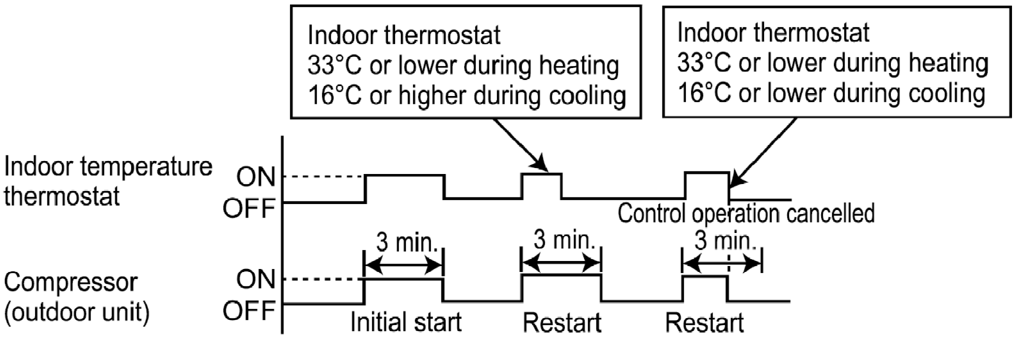
1. Fixing at LO, MED or HI / When LO, MED or HI is set, the relay switches and operation is carried out at that setting.
2. Automatic fan speed / When set to AUTO, the indoor unit fan operation changes as shown in the table below.

(Indoor temperature) - (Setting temperature) (

Mode / Fan Speed	HI	MED	LO
Cooling	+3 or higher	+1.5 ~ 3	Less than +1.5
Heating	-3 or lower	-1.6 ~ - 3	More than -1.5
Fan	MED irrespective of temperature		

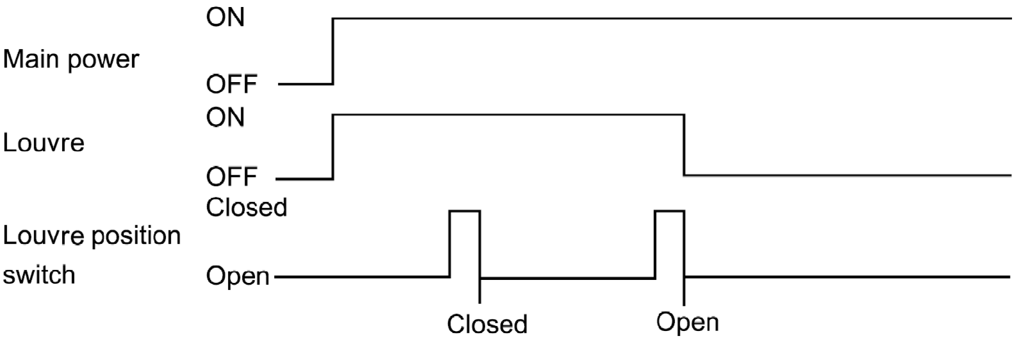
27.11. Forced operation during restart

The compressor will not stop operating for 3 minutes after cooling mode operation starts, even if the indoor unit thermostat turns off. / (However, the compressor will stop operating during this time if the indoor unit air intake temperature drops to 16°C and below during cooling mode operation.)


Indoor thermostat
33°C or lower during heating
16°C or higher during cooling
Indoor thermostat
33°C or lower during heating
16°C or lower during cooling
Indoor temperature thermostat
ON
OFF
Control operation cancelled
3 min.
3 min.
3 min.
Compressor (outdoor unit)
ON
OFF
Initial start
Restart
Restart

27.12. Louvre control (models with louvre)

1. When main power is turned on / When the power is turned on, indoor unit louvre position detection is carried out twice and then the indoor unit louvre stops.


ON
Main power
OFF
ON
Louvre
OFF
Closed
Louvre position switch
Open
Closed
Open

2. During initial operation / When the OFF/ON button is pressed to start the operation, the louvre moves through one full cycle, and then swings automatically (if AUTO has been set using the remote control) or moves to the setting angle (if MANUAL has been set using the remote control).
3. When operation stops / When the OFF/ON button is pressed to stop the operation, the louvre moves through one full cycle, and then stops in the down position, regardless of the remote control setting.
4. When thermostat is off / When operation is stopped by the indoor thermostat, the louvre moves through one full cycle, and then stops in the horizontal position, regardless of the remote control setting.

27.13. Outdoor unit fan excess heat dissipation control

1. When the operation is stopped while the compressor is in operation, the outdoor fan will run at SUPER HI fan speed for approximately 60 seconds and then stops.

27.14. Discharge temperature control

1. Operation / When the discharge temperature sensor detects a temperature of 100°C or higher during cooling mode operation, the liquid bypass valve will be turned on.
2. Cancelling / When the discharge temperature sensor detects a temperature of 70°C or lower, the liquid bypass valve will be turned off.

27.15. Emergency operation

When the emergency operation switch (DSW1) on the outdoor unit printed circuit board is set to emergency, the emergency operation is enabled. This allows normal operation to continue, with all abnormalities other than a discharge temperature abnormality, high pressure abnormality or overcurrent abnormality being ignored.

27.16. DIP switch settings

- Indoor unit printed circuit board (DSW1)

No.	Setting type	Factory shipment	Remarks
1	Group address setting (twin/triple address setting)	OFF	When group operation is being carried out using the r control, this address is set in order to control the orde starting for the indoor units. (If No. 8 is ON, twin/triple address setting is carried out.)
2		OFF	
3		OFF	
4		OFF	
5	Automatic restart	ON	When set to ON, operation after a power outage resum the settings which were in effect before the outage. (T backup time is semipermanent.)
6	Filter sign time	OFF	When set to ON, the filter sign times can be set to 2,50
7	Louvre control	ON	When set to OFF, louvre control is disabled.
8	Twin/triple slave unit setting	OFF	When set to ON, the unit is designated as a slave unit.

28. WIRED REMOTE CONTROL INSTALLATION MANUAL

Wired Remote Control Installation Manual

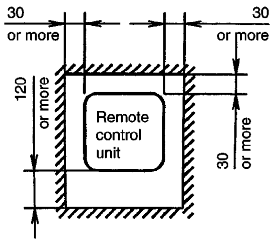
- Before installing the wired remote control, be sure to thoroughly read the “Notes with regard to safety” section of the installation manual provided with the indoor unit.
- After installing the wired remote control, carry out a test operation to check that the remote control functions properly, and also explain the operation and cleaning procedures to the customer in accordance with the details in instruction manual. Furthermore, ask the customer to keep this installation manual and the instruction manual in a safe place for later reference.

1. ACCESSORIES SUPPLIED WITH WIRED REMOTE CONTROL

Name	Q'ty	Diagram	Remark	Name	Q'ty	Diagram	Remark
Remote control	1			4mm screw	3		Installing the remote control to a wall
Remote control cable	1		Length (10m)	M4 screw	3		Installing the remote control to an outlet box
				Round terminal	2		Connecting to indoor unit terminal block

2. NOTES REGARDING WIRED REMOTE CONTROL SETTING-UP LOCATION

- Select a place where the remote control can be operated easily (after obtaining approval from the building's owner).
- Install in a place which is away from direct sunlight and as free from humidity as possible.
- Install in a place which is as flat as possible to avoid warping of the remote control.
  (If installed to a wall an uneven surface, damage to the LCD case or operation problems may result.)
- Install in a place where the LCD can be seen easily. If the remote control is installed somewhere which is too low or too high, it may be difficult to read the LCD. (Standard height from the floor is 1.2 to 1.5 meters.)
- Avoid installing the remote control cable near refrigerant pipes or drain pipes.
- Install the remote control cable at least 5 cm away from other electric wires (including stereo and TV cables) to avoid mis-operation (electromagnetic noise).
- If passing the remote control cable through a wall, be sure to install a water trap above the cable.
- Allow sufficient space around the remote control as shown in the illustration at right.
  Secure the remote control lower case to the wall or to an outlet.

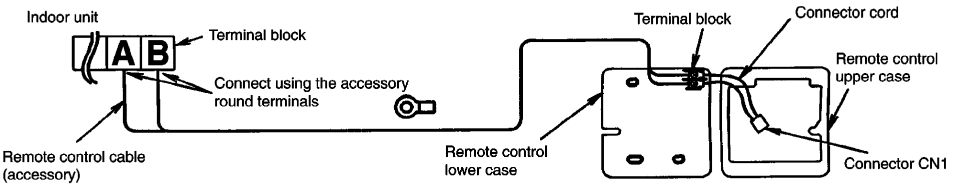


3. REMOTE CONTROL INSTALLATION

- Be sure to turn off the main power before installing and connecting the remote control.
  (If the remote control is connected while the power is still turned on, the remote control displays may not appear.)
  If no displays appear on the remote control, check while referring to “If no remote control displays appear” in 5 Test operation.
- The remote control cable is live during use, so take care not to short it.

Remote control wiring

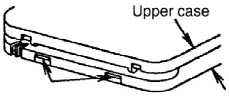
- Connect the indoor unit and the remote control as shown in the illustration below.
- The remote control cable is non-polar.
- At the time of shipment from the factory, the connector cable used to connect the terminal block and connector CN1 is disconnected. When connecting the remote control wiring and installing the remote control, be sure to connect the cord to the connector CN1.



Extending the remote control cable

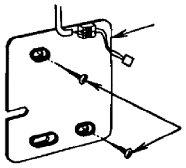
- Solder a sheathed PVC cord or cable (0.5 – 2 mm^2) with specifications among those given below to the remote control end of the accessory remote control cable (10 m).
  - * PVC round cabtire cord IEC 502
  - * 600V PVC-insulated PVC sheathed round cable IEC 227-4
  - * 600V PVC-insulated PVC sheathed flat cable IEC 227-4

NOTE The maximum possible length for the remote control cable is 200 m.



Remote control installation procedure

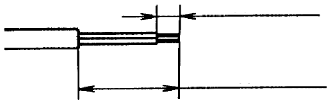
- Remove the remote control lower case.
  (Insert a flat-tipped screwdriver or similar 2 to 3 mm into one of the gaps at the bottom of the case, and then twist the screwdriver to open. [Refer to the illustration at right.])
  Be careful not to damage the lower case.
- Secure the lower case to the wall or outlet box.
  (Refer to the illustration at right for the embedded and exposed positions for remote control cable.)

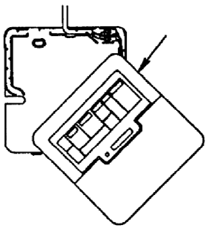


NOTE

- Be sure to use only the accessory screws.
- Do not bend the lower case when tightening the screws. (If the screws are overtightened, damage may result.)
- Do not remove the protective tape which is affixed to the upper case circuit board.

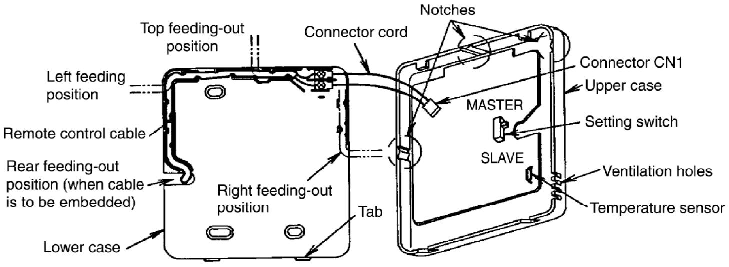
- If installing the remote control with the remote control cable exposed, use pliers to cut a notch into the upper case. (The feeding-out direction can be either up or to the left or right)
- Strip the end of the remote control cable which is to be connected to the remote control. (Refer to the illustration at right)

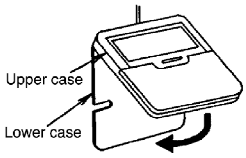




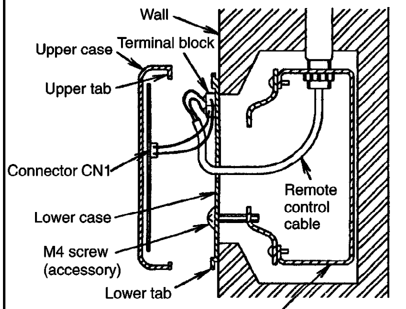
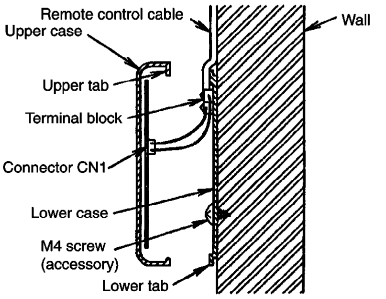
- Route the remote control cable inside the lower case in accordance with the intended feeding-out direction. (Refer to the illustration below.)
  Securely connect connector CN1. (If it is not connected the remote control will not operate.)

NOTE After connecting the connector, do not suspend the upper case by its own weight, otherwise the connector cord may break.


Notches
Top feeding-out position
Connector cord
Left feeding position
Connector CN1
Upper case
MASTER
Remote control cable
Setting switch
SLAVE
Rear feeding-out position (when cable is to be embedded)
Ventilation holes
Right feeding-out position
Temperature sensor
Tab
Lower case


Upper case
Lower case

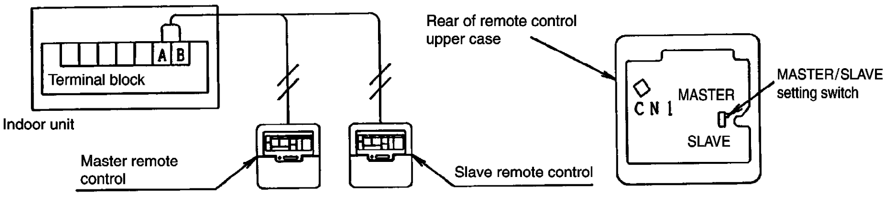
- If controlling using two remote controls, refer to “Control using two remote controls” in “4 Settings”.
- Secure the upper case to the lower case.
  (Hook the upper tab of the upper case into the lower case, and then push the upper case until it snaps shut onto the lower case tab, while being careful not to clamp the remote control cable and the connector cord.)

If remote control cable is embedded	If installing with the remote control cable exposed
1. Embed an outlet box (JIS C 8336) into the wall, and then secure the remote control base plate to the outlet box with the two accessory M4 screws. Make sure that the base plate is flat against the wall at this time, with no bending (looseness) 2. Pass the remote control cable into the box and then install the remote control.  Wall Upper case Terminal block Upper tab Connector CN1 Remote control cable Lower case M4 screw (accessory) Lower tab Medium-sized square outlet box (JIS C 8336) (obtain locally) Part No. DS3744 (Matsushita Electric Industrial Co., Ltd.) or equivalent	1. Secure the remote control base plate to the wall with the two accessory 4 mm screws. 2. The feeding-out direction for the remote control cable can be either up or to the left or right. (Refer to the illustration above.) After determining the feeding-out direction, use pliers to make a notch in the cover. 3. Route the remote control cable as shown in the illustration above. Pull the cord firmly around the outside of the base plate at this time.  Remote control cable Upper case Wall Upper tab Terminal block Connector CN1 Lower case M4 screw (accessory) Lower tab

4. SETTINGS

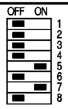
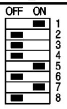
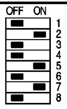
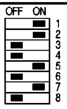
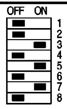
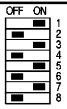
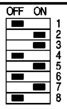
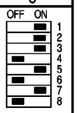
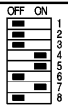
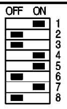
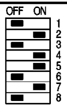
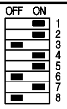
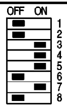
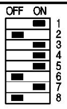
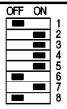
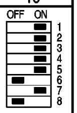
Control using two remote control

- Up to two remote controls can be installed for a single indoor unit, and either remote control can be used to operate the indoor unit.
- The indoor unit can be operated with the last switch pressed having priority.
  1. (1) Decide which is to be the master and which is to be the slave remote control.
     The master or slave states of the remote control is set automatically. The MASTER/SLAVE setting switch can also be use to make the setting manually, however if a manual setting is made, that manual setting has priority.
     Be sure to turn off the main power before making a manual setting.
  2. (2) Connect the remote controls.
     Connect both remote control to terminals (A) and (B) on the indoor unit terminal block (non-polar).


A
B
Terminal block
Indoor unit
Master remote control
Slave remote control
Rear of remote control upper case
CN 1
MASTER
SLAVE
MASTER/SLAVE setting switch

Group control

- All in group will be remote control thermistor setting when using the remote control thermistor.
- Up to a maximum of 16 indoor units can be connected at the time of group control.
  (Do not connect heat pump unit with cooling only unit.)
- Indoor unit No. is possible to set automatically at the time of group control. However, which indoor unit will be which number is unknown.
  Indoor unit No. is also possible to set manually with DIP switches. Since manual address setting is priority, when performing automatic address setting after doing manual setting turn off all DIP switches from No. 1 to No. 4, and then stop the operation and press three switches such as [AIR SWING AUTO] [OPERATION] • [A/C No.] at the same time.
  (Do not use manual address setting and automatic address setting together.)

Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	Unnecessary operation	1 ~ ON	2 ~ ON	1, 2 ~ ON	3 ~ ON	1, 3 ~ ON	2, 3 ~ ON	1, 2, 3 ~ ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	4 ~ ON	1, 4 ~ ON	2, 4 ~ ON	1, 2, 4 ~ ON	3, 4 ~ ON	1, 3, 4 ~ ON	2, 3, 4 ~ ON	1, 2, 3, 4 ~ ON

Automatic address resetting for group control

- The address settings for group control (air conditioner Nos. 1 to 16) can be reset automatically.
  (1) While operation is stopped, press the AUTO switch. A/C NO. and OPERATION switches simultaneously.

Switching the thermistor

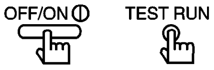
- The temperature detection thermistor can be switched between the thermistor at the indoor unit and the thermistor at the remote control. However, do not switch to the remote control thermistor if using two remote controls.
  (1) While operation is stopped, press and hold the TEST RUN switch, and then press the UP and DOWN switches together.
  (2) “00” or “01” will appear in the time display.
  (3) Press the ▲ or ▼ timer switches to switch display between “00” and “01”.
  “00” … Indoor unit setting (factory default)
  “01” … Remote control setting
  (4) Press the SET switch. (Be sure to press the SET switch so that normal operation mode can be resumed.)
- Repeat the procedure in steps (1) to (4) to change the setting again.

Energy save setting

- Upper and lower limits can be set for the setting temperature during cooling and heating operation (Energy save setting)
  (1) While operation is stopped, press the UP and DOWN switches simultaneously.
  (2) “0” (zero) will flash in the clock display at this time, so press the SET switch.
  (3) To set an upper limit (Setting a temperature above the energy save temperature will not be possible).
  Press the OPERATION switch unit HEAT is displayed.
  Press the UP or DOWN switch to set the temperature.
  Press the SET switch.
  Example: If the heating display is set to 28C, setting the temperature to higher than 28C will not be possible.
  (4) To set a lower limit (Setting a temperature below the energy save temperature will not be possible).
  Press the OPERATION switch unit COOL is displayed.
  Press the UP or DOWN switch to set the temperature.
  Press the SET switch.
  Example: If the cooling display is set to 22C, setting the temperature to lower than 22C will not be possible.
  (5) If the CANCEL switch is pressed during steps (3) or (4) above, the energy save setting will be cleared.
- Press the SET switch or the CANCEL switch to return to normal operation mode after making an energy save setting in steps (3) to (5).

5. TEST OPERATION

- Turn on the main power.
- After 3 minutes have passed since the power was turned on, press the OFF/ON switch on the remote control. (No operation occurs within 3 minutes after the power was turned on.)
- Press the TEST RUN switch within 1 minute of pressing the OFF/ON switch.
- Next, select the operation mode. (Be sure to select cooling mode first, and run the unit in this mode for 5 minutes or more.)
- Press the OFF/ON switch or the TEST RUN switch to cancel test operation.
- Test operation will be cancelled automatically after 30 minutes.



If no remote control displays appear

- Check whether LED1 (green) on the indoor unit printed circuit board is illuminated or switched off.
  If it is switched off, check the circuits on the indoor unit printed circuit board.
- Check once more that the remote control cable is securely connected. (Check for loose terminals, poor contacts, connection positions terminal block, etc.)

- If the above checks show that nothing is wrong but nothing appears on the remote control display, it is possible that the remote control was connected while the main power was still turned on.
  If such is the case, carry out the following.
- Set DIP switch (DSW1) No. 1 to 4 the ON position, and then turn on the main power. If the display appears after about 30 seconds, turn DIP switches 1 to 4 to OFF position.

6. SELF-DIAGNOSIS FUNCTION

The LED1 (green) indicators on the indoor unit and outdoor unit printed circuit boards illuminate to indicate that the printed circuit boards are operating normally. If the LEDS are switched off or are flashing irregularly, check the power supply, and turn it off and then back on again.

If “CHECK” is flashing on the timer

- If the “CHECK” display on the wired remote control is flashing, the details of the problem(s) are displayed on the timer display screen each time the CHECK switch is pressed.
- Further details of the problem can be displayed by pressing the SELECT switch while the general problem details are being displayed.

Example of current problem display

Press the CHECK switch. → Continue pressing the SELECT switch while the problem details are being display.

Problem display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK F 26			A/C No. 01

Detail display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK – 01			A/C No. 01

If “CHECK” is not flashing on the timer

- If the “CHECK” display on the wired remote control is not flashing, press the CHECK switch continuously for 5 seconds or more to display the problem details for the last problem or the problem before that.
- You can then switch between the display for the previous problem and the problem before that by pressing the timer ▲ or ▼ switches.
- Press the CHECK switch once more to return to the normal display.

Example of previous problem display

Press the CHECK switch for 5 seconds or more. → Continue pressing the SELECT switch while the problem details are being display.

Problem display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK 1 F 26			A/C No. 01

Detail display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK 1 – 01			A/C No. 01

Example of abnormality display before previous display

While the previous display still appears, press the ▲ switch. → Continue pressing the SELECT switch while the problem details are being display.

Problem display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK 2 F 26			A/C No. 01

Detail display →

TIMER	FAN SPEED	OPE-RATION	TEMP
CHECK 2 – 01			A/C No. 01

- The display can be switched between the previous problem and the one before that by pressing ▲ and ▼ switches.
- After eliminating the cause of the problem, press the CHECK switch once more to return to the normal display.
- If the problem disappears and operation returns to normal, CHECK display on the remote control will switch off, but the self-diagnosis LED will remain illuminated until operation is resumed.

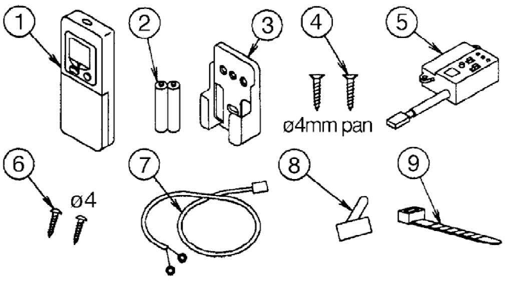
29. WIRELESS REMOTE CONTROL INSTALLATION MANUAL

Wireless Remote Control Installation Manual

- Before installing the wireless remote control, be sure to thoroughly read the "Notes with regard to safety" section of the installation manual provided with the indoor unit.
- After installing the wireless remote control, carry out a test operation to check that the remote control functions properly, and also explain the operation and cleaning procedures to the customer in accordance with the details in the instruction manual.
  Furthermore, ask the customer to keep this installation manual and the instruction manual in a safe place for later reference.

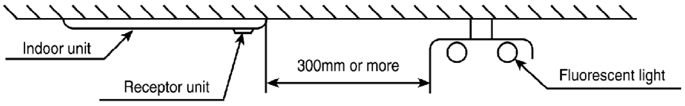
1. Accessories supplied with the wireless remote control

No.	Name	Qty
1.	Wireless Remote Control	1
2.	R03 battery	2
3.	Holder (for securing remote control)	1
4.	Holder fixing screw	2
5.	Receptor unit	1
6.	Receptor unit fixing screw	2
7.	Joint cord	1
8.	Cord clamp	8
9.	Plastic tie	3
10.	Installation manual	1



2. Points and notes regarding wireless remote control setting-up location

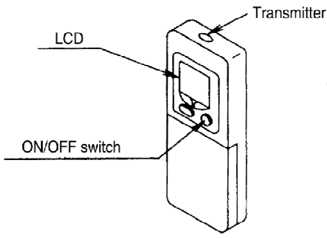
- The wireless remote control can be used to operate indoor units at a maximum range of 8 metres while directly facing infront of the indoor unit.
- If the remote control is at an angle to the receptor unit, the operation range may become shortened.
- The accessory receptor unit must be attached to the veneer panel.
- The receptor unit for the wireless remote control should be in a place where it will not be affected by direct light from any fluorescent lights. (Refer to the illustration below.)
  (If using an inverter-type fluorescent light, keep the receptor unit at least 1m away from the light, otherwise remote control operation may not work properly.)

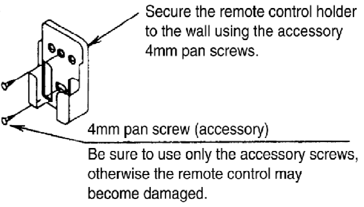


- If installing in a place where a power supply is generating electromagnetic noise, take measures such as installing a noise filter.
- Install at least 3m away from any noise sources and shield the electric cables using an iron conduit pipe.
- Install at least 1m away from equipment such as TVs and radios. (Otherwise picture distortion or static may occur.)

Wireless remote control installation procedure

- Installing the wireless remote control to a wall (for remote control storage).





Secure the remote control holder to the wall using the accessory 4mm pan screws.

Be sure to use only the accessory screws, otherwise the remote control may become damaged.

- If using a single remote control to operate several air conditioners, address setting will be required. (Refer to later in this manual.)
- For twin and triple types, install to the main unit only. (Accordingly, the installation and wiring operations described later in this manual are for the main unit only.)

Inserting the batteries

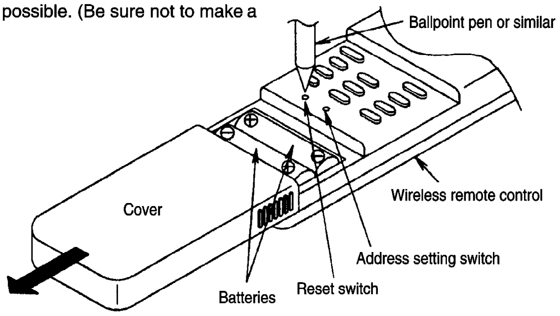
- Remove the battery compartment cover of the wireless remote control, and then insert the two accessory R03 size batteries. (Be sure not to make a mistake with the polarities.)

NOTE

The accessory batteries are to be used when checking operation. They should be replaced with new batteries as soon as possible. (Be sure not to make a mistake with the polarities.)

NOTE

- When inserting the batteries for the first time, or when replacing the batteries, the remote control may not work. In such cases, use a ballpoint pen or similar object to push the reset switch. The remote control should then start working normally.
- Replace the batteries with two new batteries of the same type.
- Rechargeable (Ni-Cd) batteries differ in aspects such as shape and performance, and thus cannot be used.


Ballpoint pen or similar
Wireless remote control
Cover
Address setting switch
Reset switch
Batteries

3. Installing the receptor unit

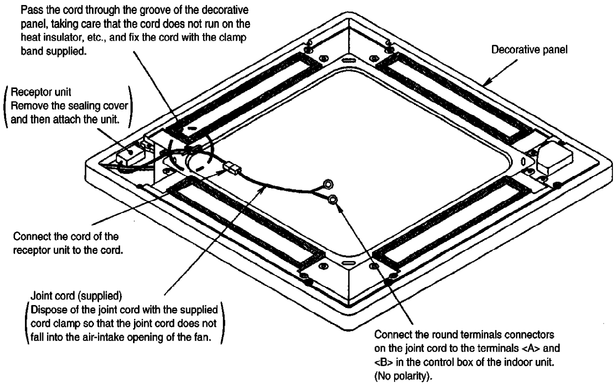
Receptor unit (for four-way cassette type) assembly procedure

1	Attach the receptor unit onto the decorative panel of the indoor unit as shown in the figure below.

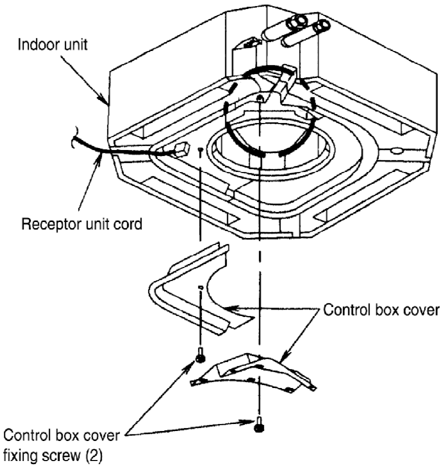
1. Remove the “sealing cover” attached at the factory. (The sealing cover will no longer be required.)
2. Attach the receptor unit with the screws supplied.

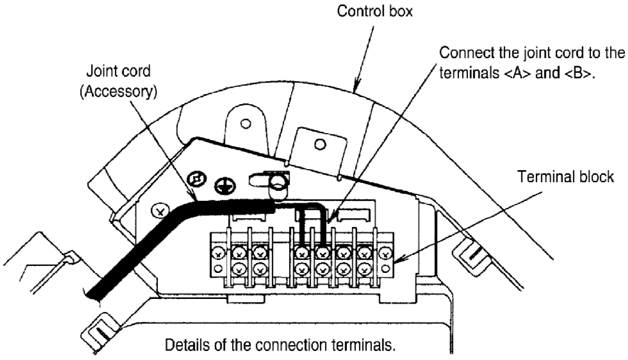
2	Route the joint cord for wiring and connect it to the terminals <A> and <B> in the control box of the indoor unit. (No polarity.)

1. Route the joint cord for wiring as shown in the figure (figure of the back of decorative panel) below.


Pass the cord through the groove of the decorative panel, taking care that the cord does not run on the heat insulator, etc., and fix the cord with the clamp band supplied.
Decorative panel
(Receptor unit Remove the sealing cover and then attach the unit.)
Connect the cord of the receptor unit to the cord.
Joint cord (supplied) (Dispose of the joint cord with the supplied cord clamp so that the joint cord does not fall into the air-intake opening of the fan.)
Connect the round terminals connectors on the joint cord to the terminals <A> and <B> in the control box of the indoor unit. (No polarity).

2. Remove the control box cover by removing the two fixing screws and connect the joint cord to the terminals <A> and <B> in the control box.


Indoor unit
Receptor unit cord
Control box cover
Control box cover
fixing screw (2)

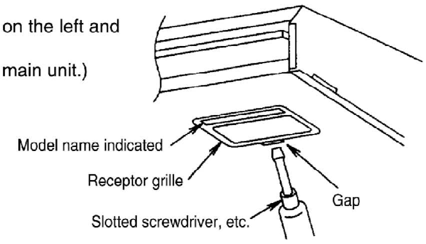

Control box
Joint cord
(Accessory)
Connect the joint cord to the
terminals <A> and <B>.
Terminal block

Details of the connection terminals.

Receptor unit (for ceiling type) assembly procedure

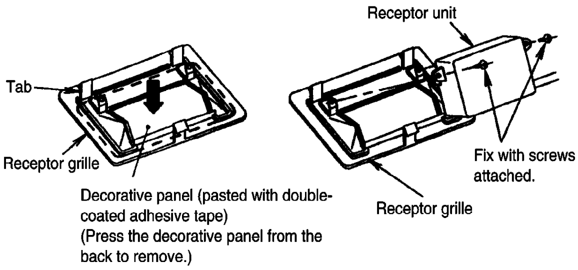
1	Attach the receptor unit onto the indoor main unit as shown in the figure below.

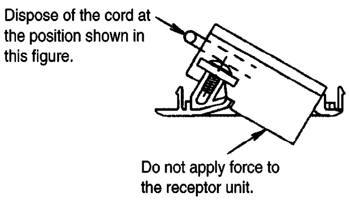
1. Remove the air-intake grille and the side cover.
   To remove the side cover, remove the fixing screw each on the left and the right and pull the side cover towards you.
   (Refer to the Installation Manual supplied with the indoor main unit.)


Model name indicated
Receptor grille
Gap
Slotted screwdriver, etc.

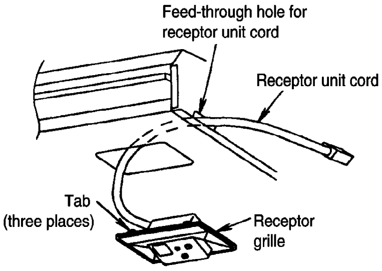
2. Remove the receptor grille (component on which the model name is shown) to the right on the air-blow opening. (Fixed with three tabs.)
   (There should be a gap at the rear center of the receptor grille. Insert the tip of a slotted screwdriver, etc., 2 to 3mm into the gap and pry off the receptor grille to remove.)

3. Remove the decorative panel for the receptor grille.
   (Press the decorative panel from the back to remove.)
   (The decorative panel will no longer required.)


Receptor unit
Tab
Receptor grille
Decorative panel (pasted with double-coated adhesive tape)
(Press the decorative panel from the back to remove.)
Fix with screws attached.
Receptor grille


Dispose of the cord at the position shown in this figure.
Do not apply force to the receptor unit.

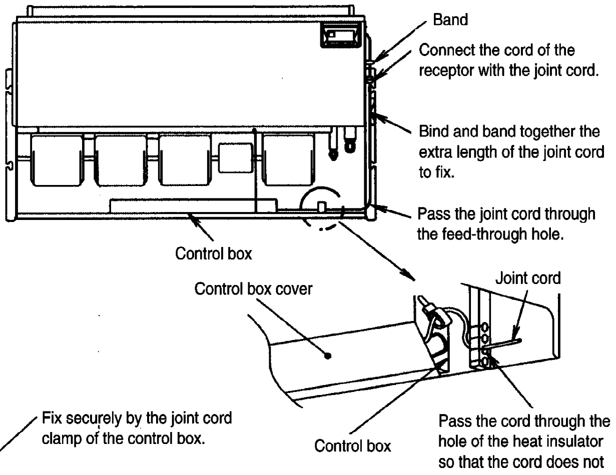
4. Attach the receptor unit for the wireless remote control onto the receptor grille. (Use two screws to fix.)
5. Draw out the cord of the receptor unit through the feed-through hole toward the side plate and attach the receptor grille onto the main unit.
   Hook the three tabs onto the receptor grille to attach the receptor grille on the main unit. (Press in the receptor grille until a click sound is heard.)

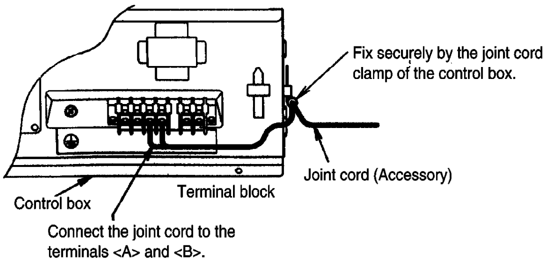

Feed-through hole for receptor unit cord
Receptor unit cord
Tab
(three places)
Receptor grille

2	Route the joint cord for wiring and connect it to the terminals <A> and <B> in the control box of the indoor unit. (No polarity)

1. Route for wiring the cord as shown in the figure to the right.

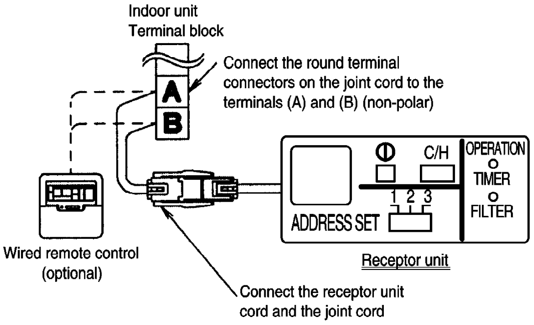
2. Remove the control box cover by removing the two fixing screws and connect the joint cord to the terminals <A> and <B> in the control box.


Band
Connect the cord of the receptor with the joint cord.
Bind and band together the extra length of the joint cord to fix.
Pass the joint cord through the feed-through hole.
Control box
Control box cover
Joint cord
Control box
Pass the cord through the hole of the heat insulator so that the cord does not float freely.


Fix securely by the joint cord clamp of the control box.
Joint cord (Accessory)
Terminal block
Control box
Connect the joint cord to the terminals <A> and <B>.

4. Receptor unit wiring

- Connect the indoor unit and the receptor unit as shown in the illustration below.
- If the indoor unit does not operate even when the wireless remote control is used to turn it on, check the indoor unit power supply.
  If LED1 (green) on the indoor unit printed circuit board is illuminated to show that the power supply is normal, turn on the EMERGENCY switch (⏻) of the receptor unit. If the indoor unit still does not operate, even when the EMERGENCY switch (⏻) is turned on, turned off the indoor unit power supply, check that all of the DIP switches 1 to 4 (DSW1) on the indoor unit printed circuit board are set to ON and then turn the power back on.

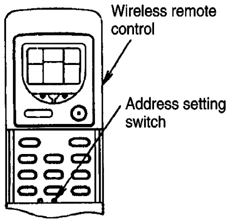

Indoor unit
Terminal block
Connect the round terminal connectors on the joint cord to the terminals (A) and (B) (non-polar)
A
B
Wired remote control
(optional)
⏻
C/H
OPERATION
TIMER
FILTER
1 2 3
ADDRESS SET
Receptor unit
Connect the receptor unit cord and the joint cord

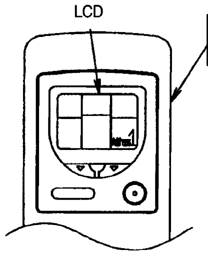
* If the optional wired remote control has been connected, check the remote control display, and set all the DIP switches 1 to 4 (DSW1) to OFF while the power is still turned on.

Address setting for wireless remote control and receptor unit (only when using more than one indoor unit.)

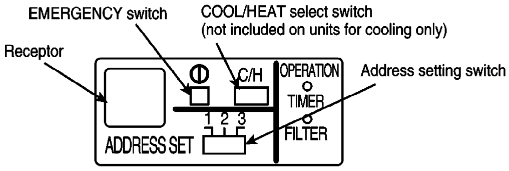
- Only the air conditioner units whose receptor unit address numbers match the remote control address number can be operated.
- At the time of shipment from the factory, the address numbers for both the wireless remote control and the receptor unit are set to "1". (When using only one indoor unit, the indoor unit can be used without changing the factory default settings.)

  Press the address setting switch with a ballpoint pen or similar object to change the address setting.
  The address number displayed on the LCD changes in the order of [ADDRESS1] → [ADDRESS2] → [ADDRESS3] → [GROUP] → [ADDRESS1] each time the switch is pressed.


Wireless remote control
Address setting switch



Only the air conditioner units whose address numbers match the address number on the LCD can be operated.


EMERGENCY switch
COOL/HEAT select switch
(not included on units for cooling only)
Receptor
Address setting switch
⏻
C/H
OPERATION
TIMER
FILTER
1 2 3
ADDRESS SET

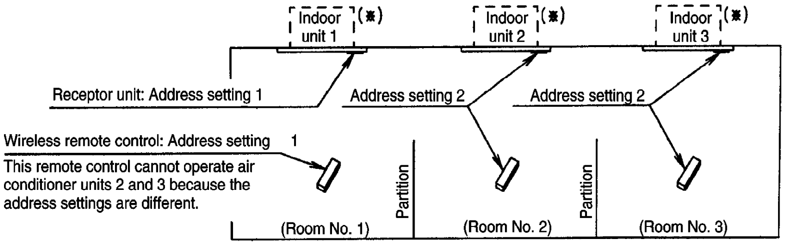
Receptor unit

NOTE

- If the batteries are replaced or the remote control is reset, the address setting will return to ADDRESS1, so you will need to repeat the address setting again.
  All setting details which are stored in memory will be cleared, so you will need to repeat the settings.
- If the address is set to GROUP, more than one indoor unit can be operated at the same time.
  (The indoor units can be operated by a single remote control regardless of the address number settings on the receptor units.)

Receptor unit address setting		
Address setting switch	1 2 3 ■□□	Address1
	1 2 3 □■□	Address2
	1 2 3 □□■	Address3

Example: If the address numbers for all the indoor units are changed, other indoor units may operate accidentally due to signal interference.

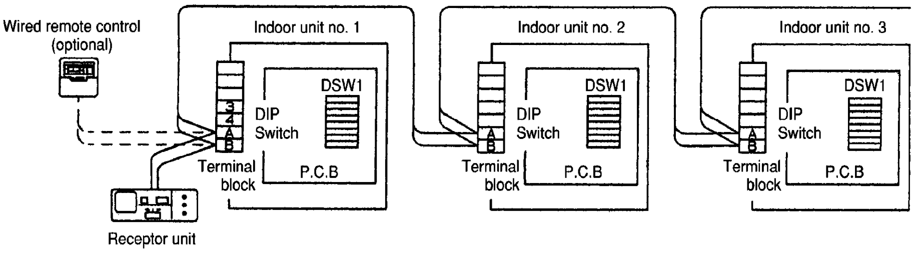

Indoor unit 1 (✱)
Indoor unit 2 (✱)
Indoor unit 3 (✱)
Receptor unit: Address setting 1
Address setting 2
Address setting 2
Wireless remote control: Address setting 1
This remote control cannot operate air conditioner units 2 and 3 because the address settings are different.
Partition
Partition
(Room No. 1)
(Room No. 2)
(Room No. 3)

Control using two remote controls

- If both the wireless remote control and the optional wired remote control are being used together, either one remote control can be used to operate the indoor units.
- The optional wired remote control can only be connected to the indoor unit besides the one with the receptor unit.
- Two wireless remote control cannot be connected at the same time.
- When using the wireless remote control and the optional wired remote control, the MASTER/SLAVE setting will not be necessary.

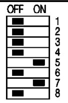
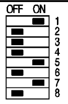
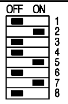
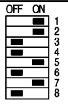
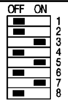
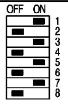
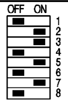
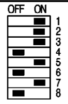
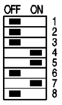
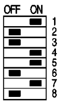
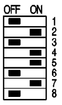
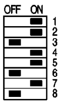
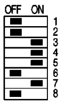
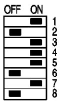
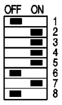
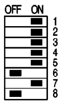
Group control

- When using group control, be sure to install the receptor unit to indoor unit No. 1. (Refer to the illustration below.)


Wired remote control (optional)
Indoor unit no. 1
Indoor unit no. 2
Indoor unit no. 3
DSW1
DIP Switch
Terminal block
P.C.B
3
4
A
B
Receptor unit

- When using group control, up to a maximum of 16 indoor units can be connected. (Do not mix heat pump units and cooling only units.)
- When using group control, the indoor unit address numbers can be set automatically. However, you will not know at this time which address number corresponds to which indoor unit.
- Setting of address numbers can be carried out manually using the DIP switches. Manual settings have priority. (Do not combine both manual settings and automatic settings.)

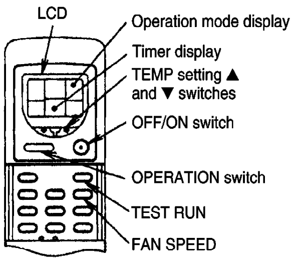
[Manual Setting]

Indoor unit No.	1	2	3	4	5	6	7	8
DIP switch (DSW1) address setting on indoor unit printed circuit board. A/C No. setting	 Unnecessary operation	 1 ~ ON	 2 ~ ON	 1, 2 ~ ON	 3 ~ ON	 1, 3 ~ ON	 2, 3 ~ ON	 1, 2, 3 ~ ON
Indoor unit No.	9	10	11	12	13	14	15	16
DIP switch (DSW1) address setting on indoor unit printed circuit board. A/C No. setting	 4 ~ ON	 1, 4 ~ ON	 2, 4 ~ ON	 1, 2, 4 ~ ON	 3, 4 ~ ON	 1, 3, 4 ~ ON	 2, 3, 4 ~ ON	 1, 2, 3, 4 ~ ON

NOTE

The OFF/ON setting position for DIP switch No. 7 (louvre) will vary depending on the model.

5. Test mode operation


LCD
Operation mode display
Timer display
TEMP setting ▲ and ▼ switches
OFF/ON switch
OPERATION switch
TEST RUN
FAN SPEED

∗ Press the TEST RUN switch within 1 minute of pressing the OFF/ON switch.

- If more than 1 minute elapsed test operation will not commence and so you will need to press the OFF/ON switch again and repeat the operation.
- Use the OPERATION switch to select the operation mode. The mode selected will appear on the operation mode display.

∗ When test operation starts, "TEST RUN" will appear in the timer display of the LCD. The indoor unit will run in the operation mode indicated at this time (COOL or HEAT).

- Test mode can be cancelled by pressing the OFF/ON switch, the TEMP, ▲ or ▼ switches, the OPERATION switch, the FAN SPEED switch or TEST RUN switch.

NOTE

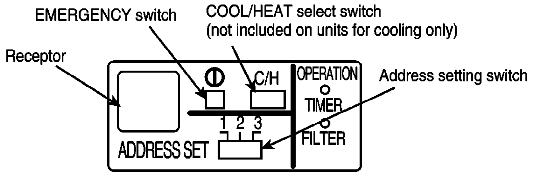
NOTE 1 During test operation, be sure to run the units in cooling mode first. If heating mode is selected first, it may cause problems with operation of the compressor.

NOTE 2 Test operation should be carried out for a minimum of 5 minutes. (Test operation will be cancelled automatically after 30 minutes.)

NOTE 3 If using the wireless remote control to carry out test operation, use the wireless remote control to cancel the test operation also.

6. Emergency operation

- If you do not have the wireless remote control (because the batteries are weak, or some other reason preventing the wireless remote control from being used), emergency operation can be carried out at the receptor unit.


EMERGENCY switch
COOL/HEAT select switch
(not included on units for cooling only)
Receptor
C/H
OPERATION
TIMER
FILTER
Address setting switch
1 2 3
ADDRESS SET

Receptor unit

- After setting the COOL/HEAT select switch on the receptor unit to either COOL or HEAT, press the EMERGENCY switch to start emergency operation.
  Press the EMERGENCY switch once more to stop emergency operation.
- The setting temperature, fan speed and louvre control will be fixed at the settings shown in the table below.

COOL/HEAT select switch	Operation mode	Setting temperature	Fan speed	Louvre
COOL	Cooling	22°C	MED	Automatic
HEAT	Heating	28°C	MED	Automatic

- While the indoor unit is running, the OPERATION indicator on the receptor unit will illuminate, and it will switch off when the indoor units stops.
- Heating operation is not available for indoor units which are for cooling only. (If set to HEAT, the setting will change to FAN instead.)

Instructions for users

Please refer to the instruction manual provided with the indoor unit for instruction on how to use the wireless remote control.

30. INSTALLATION (INDOOR UNIT)

FOUR WAY CASSETTE AIR CONDITIONERS INSTALLATION INSTRUCTIONS

REFRIGERANT
R22

HP	Panasonic Model	National Model
1.5 HP	CS-A14BB4P	CS-A14BB4N
2 HP	CS-A18BB4P	CS-A18BB4N
2.5 HP	CS-A24BB4P	CS-A24BB4N
3 HP	CS-A28BB4P	CS-A28BB4N
4 HP	CS-A34BB4P	CS-A34BB4N
5 HP	CS-A43BB4P	CS-A43BB4N
6 HP	CS-A50BB4P	CS-A50BB4N

Precautions in terms of safety

Carry out installation work with reliability after thorough reading of this “Precautions in terms of safety”.

- Precautions shown here are differentiated between ⚠**Warnings** and ⚠**Cautions**. Those that have much chances for leading to significant result such as fatality or serious injury if wrong installation would have been carried out are listed compiling them especially into the column of ⚠**Warnings**.

  However, even in the case of items which are listed in the column of ⚠**Cautions**, such items also have a chance for leading to significant result depending on the situations.
  In either case, important descriptions regarding the safety are listed, then observe them without fail.
- As to indications with illustration

⚠	This mark means “Caution” or “Warning”.

⏚	This mark means “Earth”.
- After installation work has been completed, do not only make sure that the unit is free from any abnormal condition through the execution of trial run built also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual.
  In addition, request the customer to keep this manual for installation work together with the instruction manual.

⚠ Warnings

▲ The appliance must be installed by technician, who takes into account the requirements given by ISO5149 or eventual equivalent requirements.

▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself may lead to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability according to this manual for installation work. Imperfection in installation leads to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability on a place that can sufficiently bear the weight of this unit. Insufficient strength leads to injury due to falling of the unit.

▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accidents arisen from overturn, etc.

▲ The unit must be installed in accordance with applicable national and local regulations. All electrical work should only be carried out by qualified technician and use exclusive circuit without fail.
Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.

▲ Wiring shall be connected using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section.
Imperfect connection and fixing leads to fire, etc.

▲ If installing inside a small room, measures should be taken to prevent refrigerant levels from building up to critical concentrations in the event of a refrigerant leak occurring. Please discuss with the place of purchase for advice on what measures may be necessary to prevent critical concentrations being exceeded. If the refrigerant leaks and reaches critical concentration, there is the danger that death from suffocation may result.

▲ Securely attach the protective covers for the outdoor unit connection cables and power cord so that they do not lift up after installation. If the covers are not properly attached and installed, the terminal connections may overheat, and fire or electric shock may result.

▲ Switch off all supplies before accessing any electrical part.

▲ If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.

▲ Once installation work is completed, check that there are no refrigerant gas in the room that can come into contact with sparks or flames from a fan heater, stove or kitchen range, which will cause toxic gases to be generated.

▲ When performing piping work do not mix air except for specified refrigerant (R22) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigeration cycle.

⚠ Cautions

▲ Carry out Earthing work.
Do not connect the Earth return to the gas pipe, water line pipe, lightning rod and telephone lines.
Imperfection in Earth return may lead to electric shock.

▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If gas leakage should arise and the gas builds up around the unit, such situation may lead to ignition.

▲ Mounting of the earth leakage circuit breaker is required. Omission in mounting of the earth leakage circuit breaker may lead to electric shock.

▲ Drain piping should be made to ensure secure drainage according to the manual for installation and carry out the thermal insulation to prevent the occurrence of condensation.
Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.

▲ Position the indoor unit and outdoor unit power cords and indoor/outdoor unit connection cables in a way so that they are at least 1 meter away from televisions and radios. This is to avoid problems such as interference with picture and/or sound. (However, note that depending on the electromagnetic wave conditions, interference may still occur even if the separation distance is more that 1 meter.)

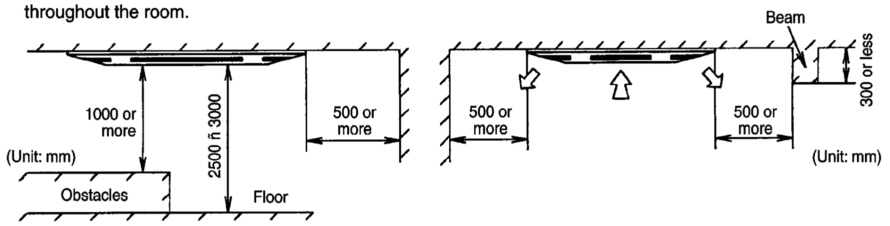
1. ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

Name	Q'ty	Appearance	Purpose	Name	Q'ty	Appearance	Purpose
Drain hose with a clip	1		For drain piping	Flat washer for M10	8		For fixing the hanging bolts
Heat insulator	1		For insulating refrigerant pipe joint	Cable clamp	2		For fixing power cable
Band	2		For fastening the heat insulator	Set screw of paper template	4		Screw M5

2. SELECTING THE LOCATION FOR THE INDOOR UNIT

Provide a check port on the piping side ceiling for repair and maintenance.

- Install the indoor unit once the following conditions are satisfied and after receiving the customer's approval.
  1. The indoor unit must be within maintenance space.
  2. The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.



✳ If the height from the floor to the ceiling exceeds three meters, air flow distribution deteriorates and the effect will be decreased.

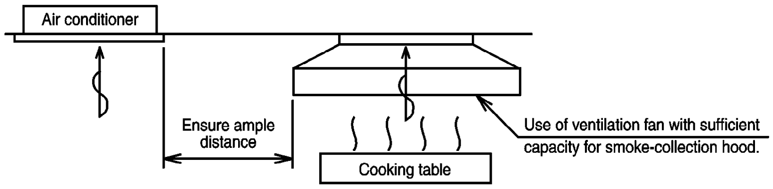
⚠ Warning
3. The installation position must be able to support a load four times the indoor unit weights.

4. The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.
5. The indoor unit must allow easy draining.
6. The indoor unit must allow easy connection to the outdoor unit.
7. Place the indoor unit according to the height from the ceiling shown in the illustration below.
8. The indoor unit must be from at least 3 m away from any noise-generating equipment. The electrical wiring must be shielded with a steel conduit.
9. If the power supply is subject to noise generation, add a suppressor.
10. Do not install the indoor unit at a laundry. Electric shocks may result.

Note
- Study thoroughly the following installation locations

1. Where in places such as restaurants and kitchens, considerable amount of oil steam and flour may adhere to the turbo fan and the fin of the heat exchanger and the drain pump, may result in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.
   In these cases, take the following actions:
   - Make sure the ventilation fan for the smoke-collection hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air conditioner.
   - Make enough distance from the cooking room to install the air conditioner in such place where it may not suck in oily steam.

Model	Height in the ceiling
CS-A14BB4P CS-A14BB4N CS-A18BB4P CS-A18BB4N CS-A24BB4P CS-A24BB4N CS-A28BB4P CS-A28BB4N	250 mm or more
CS-A34BB4P CS-A34BB4N CS-A43BB4P CS-A43BB4N CS-A50BB4P CS-A50BB4N	300 mm or more


Air conditioner
Ensure ample distance
Cooking table
Use of ventilation fan with sufficient capacity for smoke-collection hood.

2. Avoid installing the air conditioner in such circumstances where cutting oil mist or iron powder exist especially in factories, etc.
3. Avoid places where inflammable gas can be generated, flows-in, contaminated, or leak.
4. Avoid places where sulphurous acid gas or corrosive gas can be generated.
5. Avoid places near high frequency generators.

3. INSTALLATION OF INDOOR UNIT

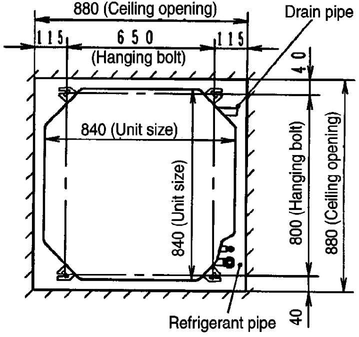
This air conditioner uses a drain up motor. Install the unit horizontally using a level gauge.

CEILING OPENING DIMENSIONS AND HANGING BOLT LOCATION

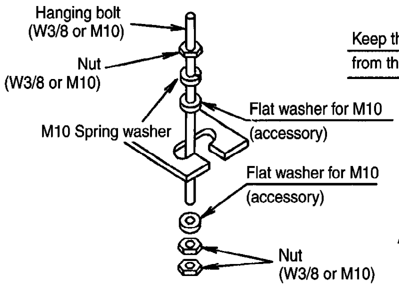
The paper template for installation may expand or shrink according to temperature and humidity.
Check on dimensions before using it.

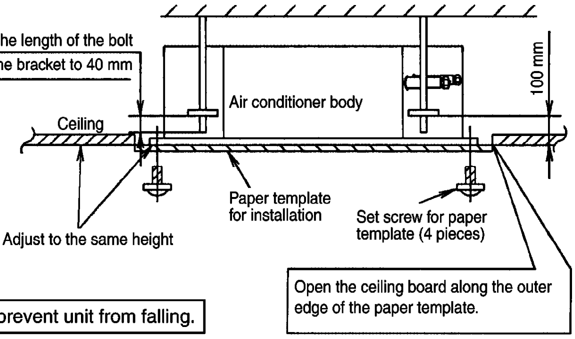
Caution	During the installation, care must be taken not to damage electric wires.

- The dimensions of the paper template for installation are the same as those of the ceiling opening dimensions.
- Be sure to discuss the ceiling drilling work with the workers concerned.


(Unit: mm)
880 (Ceiling opening)
Drain pipe
115
650
115
(Hanging bolt)
40
840 (Unit size)
840 (Unit size)
800 (Hanging bolt)
880 (Ceiling opening)
Refrigerant pipe
40

POSITIONS OF AIR CONDITIONER BODY AND CEILING SURFACE


Hanging bolt (W3/8 or M10)
Nut (W3/8 or M10)
M10 Spring washer
Flat washer for M10 (accessory)
Flat washer for M10 (accessory)
Nut (W3/8 or M10)

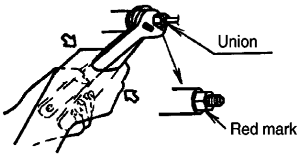

Keep the length of the bolt from the bracket to 40 mm
Air conditioner body
100 mm
Ceiling
Adjust to the same height
Paper template for installation
Set screw for paper template (4 pieces)
Open the ceiling board along the outer edge of the paper template.

⚠ **Warning**	Tighten the nuts and bolts to prevent unit from falling.

4. REFRIGERANT PIPING

Refrigerant is charged to the outdoor unit. For details, see the manual for installation work of outdoor unit. (Additional charging, etc.)

1. Brazing for piping.
   a. Perform brazing before tightening the flare nut.
   b. Brazing must be perform while blowing nitrogen gas. (This prevents generation of oxidized scale in copper pipe.)
2. When there is a lot of brazings for long piping, install a strainer at the midway of the piping. (The strainer is locally supplied.)
3. Use clean copper pipe with inner wall surface free from mist and dust. Blow nitrogen gas or air to blow off dust in the pipe before connection.
4. From the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening of the pipe).
5. After deforming the pipe, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
6. Connect pipe to the service valve or ball valve which is located below the outdoor unit.
7. After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.


Union
Red mark

- Confirm the red mark of the union (thin side) is always at lower direction after connecting piping.

Vacuum drying
After completing the piping connection, perform vacuum drying for the connecting piping and the indoor unit.
The vacuum drying must be carried out by using the service ports of both the liquid and gas side valves.

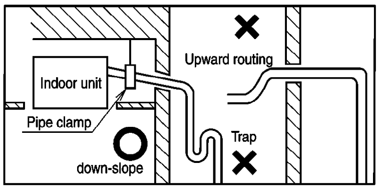
CAUTION Use two wrenches and tighten with regular torque.

Flare nut fastening torque N•m (kgf•cm)			
ø6.35 mm	18 (180)	ø15.88 mm	65(660)
ø9.52 mm	42 (430)	ø19.05 mm	100(1020)
ø12.7 mm	55 (560)		

Model	Liquid side piping	Gas side piping
CS-A14BB4P CS-A14BB4N	ø6.35 mm	ø12.7 mm
CS-A18BB4P CS-A18BB4N		
CS-A24BB4P CS-A24BB4N	ø6.35 mm	ø15.88 mm
CS-A28BB4P CS-A28BB4N	ø9.52 mm	ø15.88 mm
CS-A34BB4P CS-A34BB4N	ø9.52 mm	ø19.05 mm
CS-A43BB4P CS-A43BB4N		
CS-A50BB4P CS-A50BB4N		

5. INDOOR UNIT DRAIN PIPING

- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- During drain piping connection, be careful not to exert extra force on the drain port at the indoor unit.
- The outside diameter of the drain connection at the indoor unit is 32 mm.

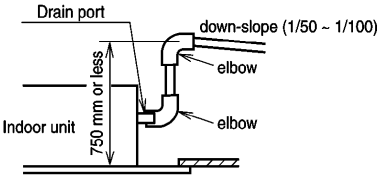

Indoor unit
Pipe clamp
down-slope
Upward routing
Trap

Piping material: Polyvinyl chloride pipe VP-25 and pipe fittings.

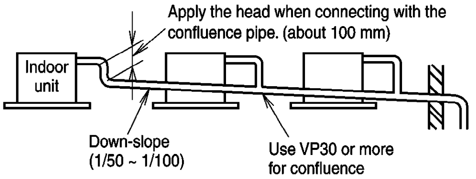
- Be sure to perform heat insulation on the drain piping.

Heat insulation material: Polyethylene foam with thickness more than 8 mm.

- The height of drain may be possible up to 750 mm.

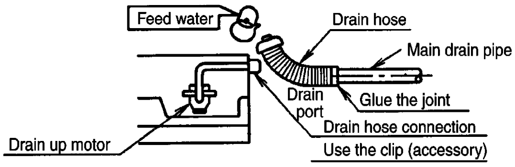

Drain port
down-slope (1/50 ~ 1/100)
elbow
elbow
Indoor unit
750 mm or less

- When drain set piping, install as shown in the figure below.


Apply the head when connecting with the confluence pipe. (about 100 mm)
Indoor unit
Down-slope (1/50 ~ 1/100)
Use VP30 or more for confluence

Drain Test The air conditioner uses a drain up motor to drain water. Use the following procedure to test the drain up motor operation.

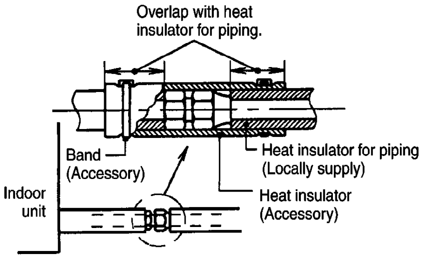
- Connect the main drain pipe to exterior and leave it provisionally until the test comes to an end.
- Feed water to the flexible drain hose and check the piping for leakage.
- Be sure to check the drain up motor for normal operating and noise when electric wiring is complete.
- When the test is completed, connect the flexible drain hose to the drain port.

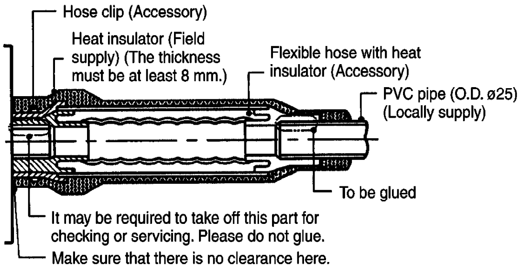

Feed water
Drain hose
Main drain pipe
Drain port
Glue the joint
Drain hose connection
Use the clip (accessory)
Drain up motor

6. HEAT INSULATION

⚠ **Caution**	Be sure to perform heat insulation on the drain and gas piping. Imperfection in heat insulation work leads to water leakage.

1. Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 120 ˚C).

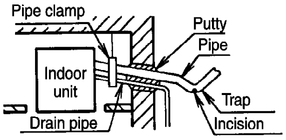

Overlap with heat insulator for piping.
Band (Accessory)
Heat insulator for piping (Locally supply)
Indoor unit
Heat insulator (Accessory)


Hose clip (Accessory)
Heat insulator (Field supply) (The thickness must be at least 8 mm.)
Flexible hose with heat insulator (Accessory)
PVC pipe (O.D. ø25) (Locally supply)
To be glued
It may be required to take off this part for checking or servicing. Please do not glue.
Make sure that there is no clearance here.

2. Precautions in high humidity circumstance.
   This air conditioner has been tested according to the “JIS Standard Conditions with Mist” and have been confirmed that there are no faults. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23 ˚C), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:
   - Heat insulation material to be prepared… Adiabatic glass wool with thickness 10 to 20 mm.
   - Stick glass wool on all air conditioners that are located in ceiling atmosphere.
   - In addition to the normal heat insulation (thickness: more than 8 mm) for refrigerant piping (gas piping: thick piping) and drain piping, add a further of 10 mm to 30 mm thickness material.

Wall seal

- When the outdoor unit is installed at a higher position than the indoor unit, install a trap so as not to instill rain water into the wall transmitted by the piping.
- Stuff the space among piping, the electric wire, and the drain hose with “Putty” and seal the penetration wall hole.
  Make sure that rain water do not instill into the wall.


Pipe clamp
Putty
Pipe
Indoor unit
Trap
Drain pipe
Incision

✳ Put the incision at the trap part of the heat insulator (for water drainage)

7. ELECTRICAL WIRING

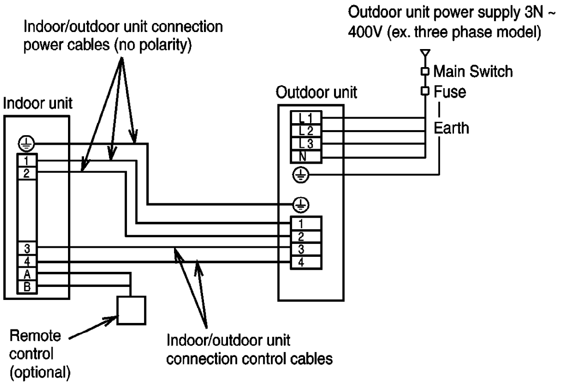
As to the main power source and cable size of outdoor unit, read the installation manual attached to the outdoor unit.

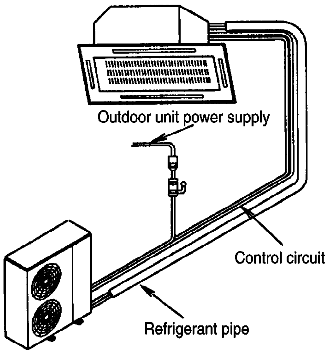
⚠**Warning**	The units must be permanently connected to the supply cables by qualified technician. Feed the power source to the unit via a distribution switch board designed for this purpose. The switch should be disconnected at all poles with a contact separation of at least 3 mm. When the supply cable is damaged it must be replaced by qualified technician.
⚠**Caution**	Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
⚠**Caution**	Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result. ⏚
⚠**Warning**	Wiring shall be connected securely by using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

1. Select a power source that is capable of supplying the current required by the air conditioner.
2. Always ground the air conditioner with a grounding wire and screw to meet the LOCAL REGULATIONS.
3. Be sure to connect the wires correctly to terminal board with connecting the crimp type ring terminal to the wires.
4. Be sure to turn off the main power before installing and connecting the remote control.

Note	After turning on the power supply for both the indoor and outdoor units, do not turn the power off after at least 1 minute has passed. (This is for the system’s automatic setting.) Turning off the power supply on the way may cause an abnormal operation.

- Use the standard power cables for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications.) or use the cables based on IEC standard. (2451EC57, 2451EC66)

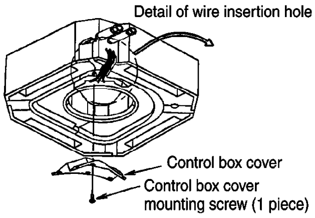

Indoor/outdoor unit connection power cables (no polarity)
Outdoor unit power supply 3N ~ 400V (ex. three phase model)
Main Switch
Fuse
Earth
Indoor unit
Outdoor unit
L1
L2
L3
N
1
2
3
4
A
B
Remote control (optional)
Indoor/outdoor unit connection control cables

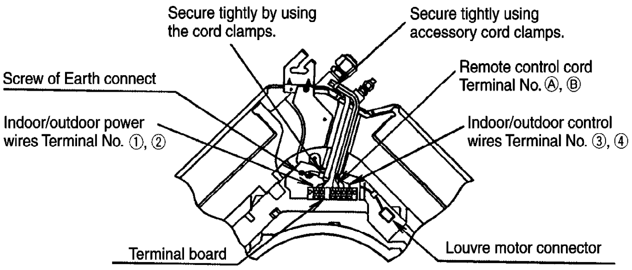

Outdoor unit power supply
Control circuit
Refrigerant pipe

CONNECTING THE WIRES TO THE CONTROL BOX

- Remove the mounting screw, remove the control box cover, and then connect the wires by following the procedure given in the illustration.

Caution	Make sure the screws of the terminal are securely tightened.


Detail of wire insertion hole
Control box cover
Control box cover mounting screw (1 piece)


Secure tightly by using the cord clamps.
Secure tightly using accessory cord clamps.
Screw of Earth connect
Remote control cord Terminal No. Ⓐ, Ⓑ
Indoor/outdoor power wires Terminal No. ①, ②
Indoor/outdoor control wires Terminal No. ③, ④
Terminal board
Louvre motor connector

8. SETTINGS

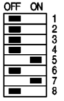
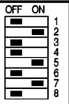
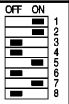
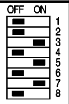
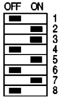
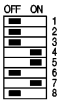
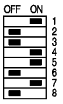
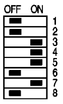
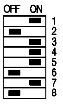
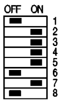
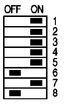
✳ Do not operate the remote control within 1 minute after turning on the power of the indoor unit.

✳ When using group control with the standard type, at least 1 unit must be set at No.1 at the indoor unit.

✳ Check the settings of the indoor unit in a case where there are no display at remote control. If there is no problem to the settings, either group control or standard type should be set at No.16 at the indoor unit before tuning the power on again.

Caution	● Do not connect to Timer Setting, Fan Power (Connector CNT1 on printed circuit board) except when the relay, or the circuit board may be broken.

- All sets in the group which uses the same remote control thermistor settings can be controlled by the same remote control thermistor.
- Up to a maximum of 16 indoor units can be connected at the time of group control. (Do not connect heat pump unit with cooling only unit.)
- Indoor unit No. will be set automatically at the time of group control. However, which indoor unit uses which number is unknown.
  Indoor unit No. is also possible to be set manually with DIP switches. Since manual address setting has priority to automatic address setting, to perform automatic address setting after doing manual setting, turn off all DIP switches from No. 1 to No. 4, and then stop the operation. Then press three switches such as [AIR SWING AUTO] • [OPERATION] • [A/C No.] at the same time. (Do not use manual address setting and automatic address setting together.)
- Centralized control is possible for master unit and slave unit at the time of group control.

Manual Setting	Indoor unit No.	1	2	3	4	5	6	7	8
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	Unnecessary operation	1 ~ ON	2 ~ ON	1, 2 ~ ON	3 ~ ON	1, 3 ~ ON	2, 3 ~ ON	1, 2, 3 ~ ON
	Indoor unit No.	9	10	11	12	13	14	15	16
	DIP switch (DSW1) address setting on indoor unit printed circuit board.								
	A/C No. setting	4 ~ ON	1, 4 ~ ON	2, 4 ~ ON	1, 2, 4 ~ ON	3, 4 ~ ON	1, 3, 4 ~ ON	2, 3, 4 ~ ON	1, 2, 3, 4 ~ ON

(Remote Control address setting)

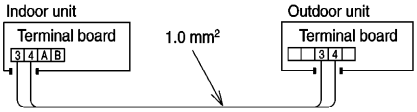
(Refer to the Operation Manual which is provided with the remote control for details.)

- Two remote controls (including the wireless remote control) can be connected. However, remote control thermistor setting is not possible.
- As for (master/slave) setting of remote control, the automatic setting and manual setting are possible. Since manual setting has priority.
- Two remote controls, which both are wireless, cannot be connected.

Indoor/outdoor unit connection control cables

- Route the connection cables apart from the power cables to prevent abnormal operations (noise can be generated).

The length of the control line can be up to 200 m.


Indoor unit
Terminal board
3 4 A B
1.0 mm²
Outdoor unit
Terminal board
3 4

9. INSTALLATION OF DECORATIVE PANEL

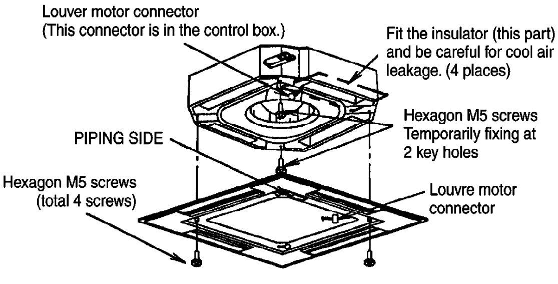
Always remove the paper template before installing the decorative panel.

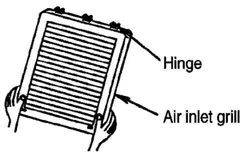
The decorative panel has its installation direction.
Confirm the direction with the display of the piping side.

1. Temporarily fix two decorative panel fixing screws (hexagon M5 screw) to the units body. (Tighten to about 10 mm in length). The fixing screws (hexagon M5 screw) are attached to the decorative panel.
2. Remove the air inlet grill from the decorative panel. (Remove the hook for the air inlet grill string.)
3. Hook the decorative panel key hole (⊂⊃) on the screws fixed in step above, and slide the panel so that the screws reach the key hole edge.
4. Retighten fully two temporarily fixed screws and other two screws. (Total 4 screws)
5. Connect the louvre motor connector.
6. After tightening these screws, install the air inlet grill (including the air filter).

⚠ **Caution**	Be sure to connect louver motor connector. Imperfect connection leads to fire, electric shock, etc.

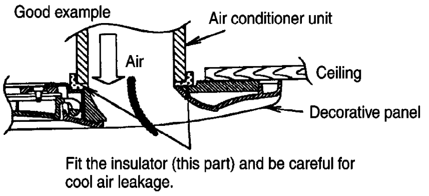
⚠ **Warning**	Be sure to hook the air inlet grill string, to prevent grill from falling and causing injury from it.

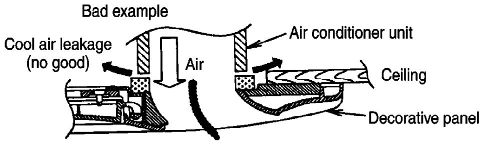

Louver motor connector
(This connector is in the control box.)
Fit the insulator (this part) and be careful for cool air leakage. (4 places)
Hexagon M5 screws Temporarily fixing at 2 key holes
PIPING SIDE
Hexagon M5 screws (total 4 screws)
Louvre motor connector


Hinge
Air inlet grill

✳ Hang the hinge on the hole of the decorative panel. (The direction of the installation is free.)

⚠ **Caution**	Securely install the decorative panel. Leakage of cool air causes condensation.

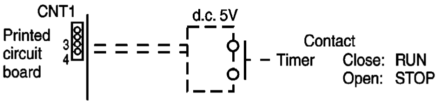

Good example
Air conditioner unit
Air
Ceiling
Decorative panel
Fit the insulator (this part) and be careful for cool air leakage.


Bad example
Cool air leakage (no good)
Air
Air conditioner unit
Ceiling
Decorative panel

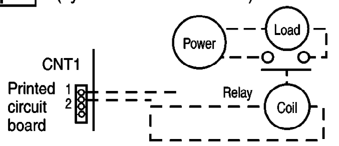
10. TIMER AND FAN OUTPUT

- ■ Connect the wires from the connector (CNT1) on printed circuit board.

Timer setting


CNT1
Printed circuit board
3
4
d.c. 5V
Contact
Timer
Close: RUN
Open: STOP

Fan Output (synchronization with fan) d.c. 12V 75mA


Power
Load
CNT1
Printed circuit board
1
2
Relay
Coil

Connect to another circuit contact of the timer.
Connect the timer cord to connector (CNT1③,④) on PCB.

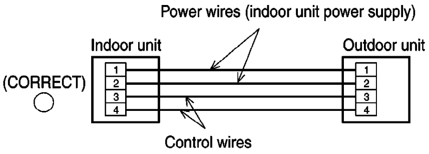
Connect the timer cord to connector (CNT1①,②) on PCB.

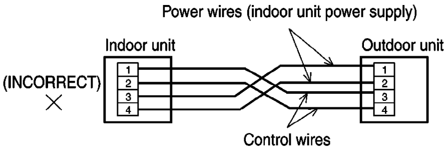
11. PRECAUTIONS IN TEST RUN

- The initial power supply must provide at least 90% of the rated voltage. Otherwise, the air conditioner may not operate.
- Test operation can be carried out using the remote control unit or at the outdoor unit. (If carrying out test operation at the outdoor unit, refer to "TEST OPERATION" in the outdoor unit installation manual.)
- If using the remote control unit to carry out test operation, follow the procedure given below.

- First, press the OFF/ON ⏻ button.
- Then press the TEST RUN button within 1 minute of pressing the OFF/ON ⏻ button.
- Next, select the operation modes.
- The temperature of the indoor unit pipes will be shown on the temperature setting display. (At the start of the test operation, it may take up to 1 minute for air conditioner number, switching time and other displays to appear.)
- After operation modes have been selected, stop the compressor for a moment.
- Press the OFF/ON ⏻ button of the TEST RUN button once more to cancel test operation mode.

Note 1 These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have been operated. In such cases, check that the power wires (connected to terminals ①and②) and the control wires (connected to terminals ③and④) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.


Power wires (indoor unit power supply)
Indoor unit
Outdoor unit
(CORRECT)
○
1
2
3
4
Control wires


Power wires (indoor unit power supply)
Indoor unit
Outdoor unit
(INCORRECT)
×
1
2
3
4
Control wires

Note 2 Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

Note 3 When running the units in heating mode during test operation, be sure to run the units in cooling mode first before selecting this mode. If heating mode is selected first, it may cause problems with operation of the compressor. (Heat pump model only.)

Note 4 Test operation should be carried out for a minimum of 5 minutes. (Test operation will be cancelled automatically after 30 minutes.)

Note 5 Test operation mode should always be cancelled once test operation itself has been completed.

12. CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

- After completing work, be sure to measure and record trial run properties, and store measuring data, etc.
- Measuring items are room temperature, outside temperature, suction temperature, blow out temperature, wind velocity, wind volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature, compressive pressure, airtight pressure.
- As to the structure and appearance, check the following items.
  - ☐ Is circulation of air adequate?
  - ☐ Is draining smooth?
  - ☐ Is heat insulation complete (refrigerant and drain piping)?
  - ☐ Is there any leakage of refrigerant ?
  - ☐ Is remote control switch operated?
  - ☐ Is there any faulty wiring?
  - ☐ Are the terminal screws loosened?

    M3…69-98N•cm {7-10kgf•cm} M4…157-196N•cm {16-20kgf•cm}
    M5…196-245N•cm {20-25kgf•cm}

13. HAND OVER

- Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.)

As to parts to be sold separately

- With regards to installation of the parts sold separately, follow the installation manual which is provided with the parts sold separately.

As for work specifications of the outdoor unit, read the OUTDOOR UNIT INSTALLATION MANUAL attached to the outdoor unit.

31. INSTALLATION (OUTDOOR UNIT)

AIR CONDITIONERS OUTDOOR UNIT INSTALLATION INSTRUCTIONS

REFRIGERANT
R22

HP	Panasonic Model		National Model	
2.5 HP	CU-A24BBP5	CU-C24BBP5	CU-C24BBN5	CU-C24BBN6
3 HP	CU-A28BBP5 CU-A28BBP8	CU-C28BBP5 CU-C28BBP6 CU-C28BBP8	CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	
4 HP	CU-A34BBP5 CU-A34BBP8	CU-C34BBP5 CU-C34BBP7 CU-C34BBP8	CU-C34BBN7 CU-C34BBN8	
5 HP	CU-A43BBP8	CU-C43BBP7 CU-C43BBP8	CU-C43BBN7 CU-C43BBN8	
6 HP	CU-A50BBP8	CU-C50BBP7 CU-C50BBP8	CU-C50BBN7 CU-C50BBN8	

Precautions in terms of safety

Carry out installation work with reliability after thorough reading of this “Precaution in terms of safety”.

- Precautions shown here are differentiated between ⚠Warnings and ⚠Cautions. Those that have much chances for leading to significant result such as fatality or serious injury if wrong installation would have been carried out are listed compiling them especially into the column of ⚠Warnings.

  However, even in the case of items which are listed in the column of ⚠Cautions, such items also have a chance for leading to significant result depending on the situations.
  In either case, important descriptions regarding the safety are listed, then observe them without fail.
- As to indications with illustration

  ⚠ This mark means “Caution” or “Warning”.   ⚠ This mark means “Earth”.
- After installation work has been completed, do not only make sure that the unit is free from any abnormal condition through the execution of try run but also explain how to use and how to perform maintenance of this unit to the customer according to the instruction manual.
  In addition, request the customer to keep this manual for installation work together with instruction manual.

⚠ Warnings

▲ The appliance must be installed by technician, who takes into account the requirements given by ISO5149 or eventual equivalent requirements.

▲ As to installation, request the distributor or vendor to perform it. Imperfection in installation caused by that having been carried out by the customer himself may lead to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability according to this manual for installation work.
Imperfection in installation leads to water leakage, electric shock, fire, etc.

▲ Carry out the installation work with reliability on the place that can bear the weight of this unit sufficiently. Insufficient strength leads to injury due to falling of the unit.

▲ Carry out predetermined installation work in preparation for strong wind such as typhoon, earthquake. Imperfection in installation work may lead to accidents arisen from overturn, etc.

▲ The unit must be installed in accordance with applicable national and local regulations.
Any electrical work should only be carried out by qualified technician and use exclusive circuits without fail.
Presence of insufficient capacity in power circuit or imperfection in execution leads to electric shock, fire, etc.

▲ Wiring shall be connected securely using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section.
Imperfect connection and fixing leads to fire, etc.

▲ If installing inside a small room, measures should be taken to prevent refrigerant levels from building up to critical concentrations in the event of a refrigerant leak occurring. Please discuss with the place of purchase for advice on what measures may be necessary to prevent critical concentrations being exceeded. If the refrigerant leaks and reaches critical concentration levels, there is the danger that death from suffocation may result.

▲ Securely attach the protective covers for the outdoor unit connection cables and power cord so that they do not lift up after installation. If the covers are not properly attached and installed, the terminal connections may overheat, and fire or electric shock may result.

▲ Switch off all supplies before accessing any electrical part.

▲ If refrigerant gas escapes during installation, ventilate the affected area. If the refrigerant gas comes into contact with sparks or naked flames, it will cause toxic gases to be generated.

▲ Once installation work is completed, check that there are no refrigerant gas in the room that can come into contact with sparks or flames from a fan heater, stove or kitchen range, which will cause toxic gases to be generated.

▲ When performing piping work do not mix air except for specified refrigerant (R22) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.

⚠ Cautions

- ▲ Carry out Earthing work.
  Do not connect the Earth return to the gas pipe, water line pipe, lightning rod and telephone lines.
  Imperfection in Earth return may lead to electric shock.
- ▲ Do not install the unit at the place where the possibility of inflammable gas leakage exists. If such gas leakages should arise and the gas builds up around the unit, such situation may lead to ignition.
- ▲ Mounting of the earth leakage circuit breaker is required. Omission in mounting of the earth leakage circuit breaker may lead to electric shock.
- ▲ Drain piping should be made to ensure secure drainage according to the manual for installation work and carry out the thermal insulation to prevent the occurrence of condensation.
  Imperfection in piping work leads to water leakage and may cause the house and property, etc. to become wet.
- ▲ Position the indoor unit and outdoor unit, power cords and indoor/outdoor unit connection cables in a way so that they are at least 1 metre away from televisions and radios.
  This is to avoid problems such as interference with picture and/or sound. (However, note that depending on the electromagnetic wave conditions, interference may still occur even if the separation distance is more than 1 metre.)

1. ACCESSORIES SUPPLIED WITH OUTDOOR UNIT

- The following parts are supplied as accessories with each outdoor unit.
  Check that all accessory parts are present before installing the outdoor unit.

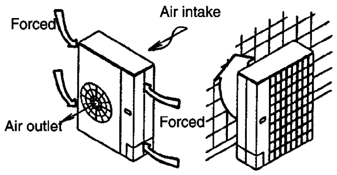
Part name	Q'ty	Diagram	Application
Protective bushing	2		For protecting electrical wires
Banding strap	3		For tying electrical wires together

Heat pump-types only

Part name	Q'ty	Diagram	Application
Drain elbow AS	1		For connecting the drain pipe (with ring seat)

2. SELECTING THE OUTDOOR UNIT INSTALLATION LOCATIONS

- Select location which satisfies the following condition, and then confirm with the customer that such a place is satisfactory before installing the outdoor unit.
  1. There should be sufficient ventilation.
  2. The outdoor unit should be sheltered as much as possible from rain and direct sunlight, and the air should be able to move around so that hot and cold air do not build up.
  3. There should not be animals or plants near the air outlet which could be adversely affected by hot or cold air coming out from the unit.
  4. The outlet air and operating noise should not be a nuisance to other occupants nearby.
  5. The location should be able to withstand the full weight and vibration of the outdoor unit, and it should also be level and safe for the unit to be installed.
  6. The intake and outlet should not be covered.
  7. There should not be danger of flammable gas or corrosive gas leaks.
  8. There should be as little back-ventilation (air blowing directly onto the fan) as possible.
     (If strong wind blows directly onto the fan, it may cause problems with normal operation.)
     - If you know which direction the prevailing wind comes from during the operating season, set the outdoor unit at a right-angle to this wind direction, or so that the air outlet faces toward a wall or fence.
     - If there are obstructions near the outdoor unit and the wind direction is not constant, install an optional air guider.
  9. Do not allow any obstacles near the outdoor unit which will interfere with air flow around the air intake and air outlet.
  10. If installing in a location which is prone to snowfall, place the installation base as high as possible, and be sure to install a roof or enclosure which does not allow snow to accumulate.
  11. Avoid installing the unit in places where petroleum products (such as machine oil), salinity, sulphurous, gases or high-frequency noise are present.
  12. Be sure to leave enough space around the outdoor unit to maintain proper performance and to allow access for routine maintenance.
     - Allow enough space from any obstacles as shown in Fig.1.2 below in order to prevent short-circuits from occurring. (If installing more than one outdoor unit, make the necessary space available as outlined in 14.)
       However, there should be at least 1 metre of free space above the unit.
     - The height of any obstacles at the air intake and outlet sides should not be greater than the height of the outdoor unit.



- When facing the air intake side toward a wall.
- When facing the air outlet side toward a wall.
- When using an optional air guider for outdoor units.

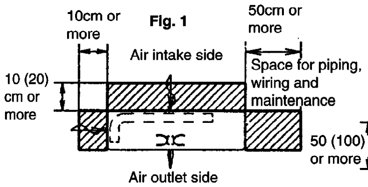


Fig. 1
10cm or more
50cm or more
Air intake side
Space for piping, wiring and maintenance
10 (20) cm or more
Air outlet side

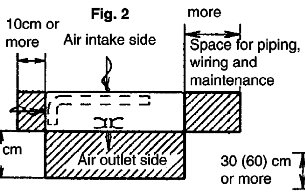


Fig. 2
10cm or more
Air intake side
50cm or more
Space for piping, wiring and maintenance
50 (100) cm or more
Air outlet side

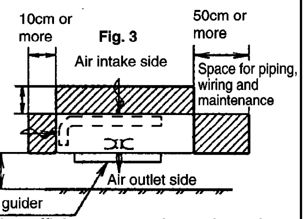


Fig. 3
10cm or more
50cm or more
Air intake side
Space for piping, wiring and maintenance
30 (60) cm or more
Air outlet side
Air guider

✻ Maintain sufficient space above the unit.

13. If is not possible to leave 50 (100)cm at the air outlet side as shown in Fig.2, the installation method shown in Fig.3 can be used if an optional air guider for outdoor units is installed. Install according to the instructions given in the separate instruction manual.

(NOTE) When installing the air guider

1) If directing the air upward, there should not be obstacles above the outdoor unit.
2) If directing the air to the left or right, there should not be obstacles at the left or right of the outdoor unit.
3) Never use the air guider in locations which are subject to snowfall.
   If snow gets inside the air guider, it could cause the fan to freeze up.
4) If connecting outdoor units in series, direct the flow upward.

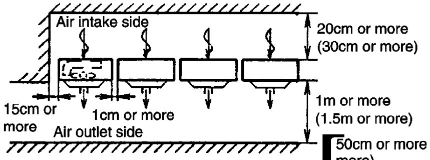
Air guider for outdoor units

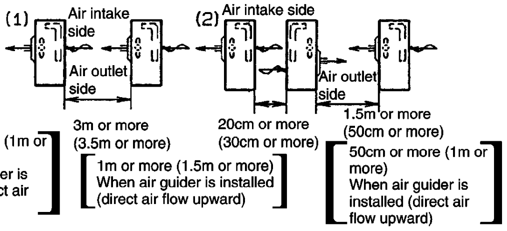
Model Name	Part No.
CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP6 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5	CZ-UFS01P
CU-C24BBN5 CU-C24BBN6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	CZ-UFS01N

Model Name	Part No.
CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP8 CU-C34BBP5 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8	CZ-UFD01P
CU-C34BBN7 CU-C34BBN8 CU-C43BBN7 CU-C43BBN8 CU-C50BBN7 CU-C50BBN8	CZ-UFD01N

14.If installing more than one outdoor unit, allow enough space around each unit as shown below.

- When installing units side by side
- When installing units facing each other


Air intake side
20cm or more (30cm or more)
1m or more (1.5m or more)
15cm or more
1cm or more
Air outlet side
50cm or more (1m or more) When air guider is installed (direct air flow upward)


(1)
Air intake side
Air outlet side
3m or more (3.5m or more)
1m or more (1.5m or more) When air guider is installed (direct air flow upward)
(2)
Air intake side
Air outlet side
20cm or more (30cm or more)
1.5m or more (50cm or more)
50cm or more (1m or more) When air guider is installed (direct air flow upward)

✻ Maintain sufficient space above the unit.

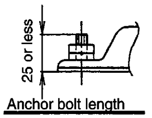
Values inside brackets indicate distances when installing the 4HP-6HP.

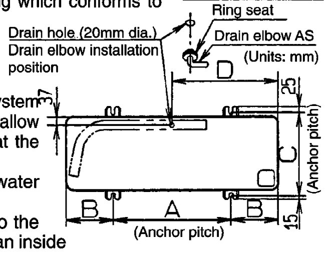
- The distance given above are the minimum distance required in order to maintain proper performance. Allow as much space as possible in order to get the best performance from the units.

3. TRANSPORTING AND INSTALLING THE OUTDOOR UNIT

- Transporting
  1. The outdoor unit should be transported in its original packaging as close to the installation location as possible.
  2. If suspending the outdoor unit, use a rope or belt, and use cloth or wood as padding in order to avoid damaging the unit.
  3. Use the handles at left and right to transport the unit, and be careful not to touch your hands or other objects against the fan.

- Installation
  1. Read the “Selecting the outdoor unit installation location” section thoroughly before installing the outdoor unit.
  2. If installing the unit to a concrete base or other solid base, use M10 or W3/8 bolts and nuts to secure the unit, and ensure that the unit is fully upright and level.
     (The anchor bolt positions are shown in the diagram at the right side.)
     In particular, install the unit at a distance from the neighbouring building which conforms to regulations specified by local noise emission regulation standards.
  3. Do not install the outdoor unit to the building’s roof.
  4. If there is a possibility that vibration may be transmitted to the rooms of the building, place rubber insulation between the unit and the installation surface.
  5. Drain water will be discharged from the outdoor unit when operating the system in heating or defrosting modes. Select an installation location which will allow the water to drain away properly, or provide a drainage channel so that the water can drain away.
     (If this is not done, the drain water may freeze during winter, or the water may spill down to areas underneath the installation location.)





- If a drain pipe needs to be installed, insert the accesory drain elbow into the mounting hole at the bottom of the outdoor unit, and connect a hose with an inside diameter of 15mm to this drain elbow.
  (The hose is not supplied.)

※ If using the drain elbow, install the outdoor unit on a base which is at least 5cm high.

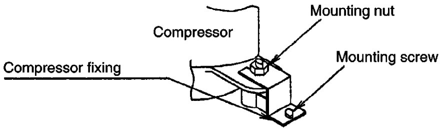
NOTE In cold regions (where the outdoor air temperature can drop to 0˚C or below continuously for 2-3 days), the drain water may freeze, and this may prevent the fan from operating. Do not use the drain elbow in such cases.

Anchor bolt position

Model Name	Amm	Bmm	Cmm	Dmm
CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP6 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C24BBN5 CU-C24BBN6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8 CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8	500	200	360	450
CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	700	200	360	720

CAUTION

- Be sure to remove the compressor fixing brackets.
  (Some models are not equipped with compressor fixing brackets.)
- To remove, first remove the mounting screws, loosen the compressor mounting nuts and then pull sideways.
- After removing, be sure to tighten the compressor mounting nuts again.



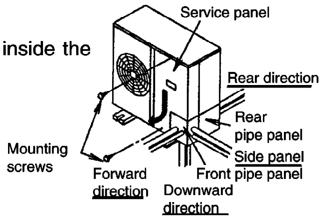
4. CONNECTING THE PIPES

※ This product is used new refrigeration (R407C).

- Use a clean pipe which does not include water or dust for inside of piping.
- When cutting the refrigerant pipes, a piping cutter must be used. Before connecting the refrigerant pipes blow nitrogen and blow off dust in the pipes.
  (Never use tools which cause a lot of dust such as a saw and a magnet.)
- When waxing replace nitrogen inside the piping after removing dirt and dust. (In order to prevent oxidization scale from forming inside the piping).
- The refrigerant pipes are of particular importance.
  The installation work for refrigerant cycles in separate-type air conditioners must be carried out perfectly.

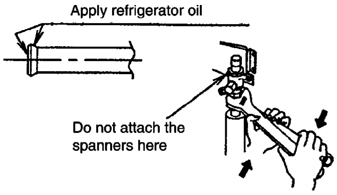
Model Name	Pipe diameter (mm)		Equivalent length (m)	Difference of elevation (m)
	Liquid-side pipes	Gas-side pipes		
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	ø6.35	ø15.88	50	30
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8	ø9.52	ø15.88	50	30
CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	ø9.52	ø19.05	50	30

1. Local pipes can project in any of four directions.
   - Make holes in the pipe panels for the pipes to pass through.
   - Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.
     [Removing the service panel].
     (1) Remove the two mounting screws.
     (2) Slide the service panel downward to release the pawls.
     After this, pull the service panel toward you to remove it.



2. Notes when connecting the refrigerant pipes.
   - Use clean copper, pipes with no water or dust on the insides.
   - Use phosphorus-free, unjointed copper pipes for the refrigerant pipes.
   - If it is necessary to cut the refrigerant pipes, be sure to use a pipe cutter, and use compressed nitrogen or an air blower to clean out any foreign particles from inside the pipe.
   - Be careful not to let any dust, foreign materials or water get inside the pipes during connection.
   - If bending the pipes, allow as large a bending radius as possible. Do not flex the pipes any more than necessary.
   - If joining pipe ends, do so before tightening the flare nut.
   - Always blow the pipe end with nitrogen while joining pipe ends.
     (This will prevent any oxide scaling from occurring inside the pipe.)
   - If using long pipe lengths with several joined pipe ends, insert strainers inside the pipes.(Strainers are not supplied.)
   - When tightening the flare nuts, coat the flares (both inside surfaces) with a small amount of refrigerator oil, and screw in about 3-4 turns at first by hand.
   - Refer to the following table for the tightening torques. Be sure to use two spanners to tighten.
     (If the nuts are overtightened, it may cause the flares to break or leak.)

Flare nut fastening torque N•m (kgf•cm)			
ø6.35mm	18 (180)	ø15.88mm	65 (660)
ø9.52mm	42 (430)	ø19.05mm	100 (1020)
ø12.7mm	55 (560)		



3. After piping connection has been completed, make sure that the joint areas of the indoor and outdoor units are free from gas leakage by the use of nitrogen, etc.
4. Air purge within connection piping shall be carried out by evacuation.

5. HEAT INSULATION

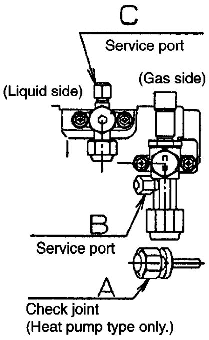
⚠ Caution	Use a material with good heat-resistant properties as the heat insulation for the pipes. Be sure to insulate both the gas-side and liquid-side pipes. If the pipes are not adequately insulated, condensation or water leakages may occur.

Liquid-side pipes	Material that can withstand 120°C or higher
Gas-side pipes	

6. CHARGING WITH REFRIGERANT

- At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30m. If the equivalent pipe length used will be 30m or less, no additional charging will be necessary.
- If the equivalent pipe length will be between 30 and 50m (40m), charge with additional refrigerant according to the equivalent length given in the table below.
  - For standard type

Model Name	Additional charging amount	Equivalent length
CU-A24BBP5 CU-C24BBP5 CU-C24BBN5 CU-C24BBN6	0.02kg/m	50m
CU-A28BBP5 CU-A28BBP8 CU-C28BBP8 CU-C28BBP5 CU-C28BBP6 CU-C28BBN5 CU-C28BBN6 CU-C28BBN8 CU-A34BBP5 CU-A34BBP8 CU-C34BBP7 CU-C34BBP5 CU-C34BBP8 CU-C34BBN7 CU-C34BBN8 CU-A43BBP8 CU-C43BBP7 CU-C43BBP8 CU-C43BBN7 CU-C43BBN8 CU-A50BBP8 CU-C50BBP7 CU-C50BBP8 CU-C50BBN7 CU-C50BBN8	0.05kg/m	



- Attention when pump down operation
  - This outdoor unit is equipped with the low pressure switch for the protection of the compressor.
    Therefore, operate the pump down according to the following procedures.

CAUTION Do not short-circuit the low pressure switch.

Procedure	Notes
1. Confirm the valve on the liquid side and the gas side is surely open.	
2. Press the COOL switch on outdoor printed board for 1 second or more.	Perform the cooling operation for five minutes or more.
3. Shut the valve on the liquid side surely.	When the valve is shut halfway, the compressor is occasionally damaged.
4. The low pressure switch operates, the unit stops, and then shut the valve on the gas side immediately.	

The pump down is completed above.

CHECKING THE PRESSURE Check the pressure at the service port on the valve and the check joint where the pipe ends have been joined according to the table at below.

Heat pump model

	A	B
During cooling operation	High pressure	Low pressure
During heating operation	Low pressure	High pressure

Cooling model only

	C	B
During cooling operation	High pressure	Low pressure

7. ELECTRICAL WIRING

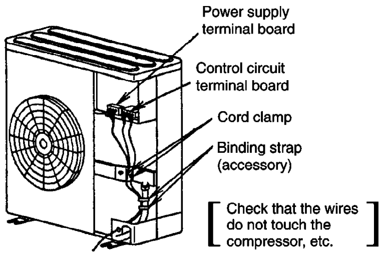
⚠ Warning	The units must be connected to the supply cables for fixed wiring by qualified technician. Feed the power source to the unit via a distribution switch board designed for this purpose, the switch should disconnected all poles with a contact separation of at least 3mm. When the supply cable is damaged, it must be replaced by qualified technician.
⚠ Caution	Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
⚠ Caution	Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result. ⏚
⚠ Warning	Wiring shall be connected securely by using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

- Connect the power supply wiring and indoor/outdoor unit connection wiring according to the electrical circuit diagram instructions.
- Clamp the wires securely to the terminal connections using cord clamps so that no undue force is placed on the wires.
- Once all wiring work has been completed, tie the wires and cords together with the binding strap so that they do not touch other parts such as the compressor and pipes.

1. Connect the power supply line to a 3-phase/380-415V (or single-phase 220-240V) power supply.

   If the phase is reversed, the self-diagnosis function will be activated and the unit will not operate. In such cases, switch over any two of the power supply wires (L1,L2,L3) (3-phase models only).

   (Never operate the unit by pressing the electromagnetic switch.)
2. The equipment shall be connected to a suitable mains network with a main impedance less than the valve indicated in the table of power supply specifications.
3. Be sure to connect the wires correctly to terminal board with connecting the crimp type ring terminal to the wires.
4. The binding screws inside the power supply box may become loosened due to vibration during transportation, so check that they are tightened securely.


Power supply terminal board
Control circuit terminal board
Cord clamp
Binding strap (accessory)

[Check that the wires do not touch the compressor, etc.]

5. Tighten the binding screws to the specified torque while referring to the table below.
6. If connecting two separate wires to a single crimped terminal, place the two crimped terminal wires together as shown in Fig. A. (If the arrangement shown in Fig. B is used, poor contacts or contact damage may result.)
7. If momentarily turning on the power supply for both the indoor and outdoor units, do not turn the power off again until at least 1 minute has passed (except when a reversed phase has been detected).

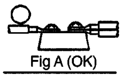


Fig A (OK)

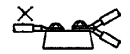


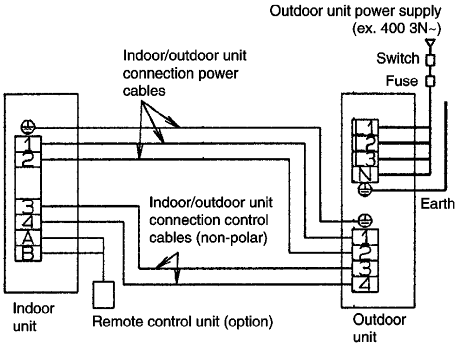
Fig B (not OK)

⚠ Warning	Use only the specified cables for wiring connections. Connect the cable securely, and secure them properly so that no undue force will be applied to the terminal connections. If the terminals are loose or if the wires are not connected securely, fire may result.

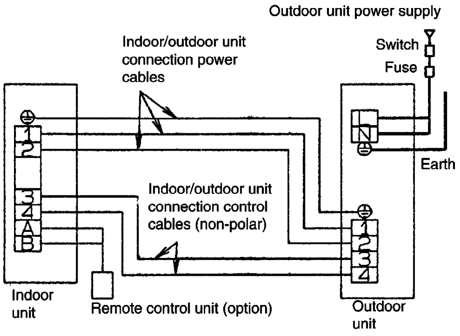
Terminal screw	Tightening torque N•cm {kgf•cm}
M3	69~98 {7~10}
M4	157~196 {16~20}
M5	196~245 {20~25}

Refer to the following diagrams for details on how to connect the power supply cables and indoor/outdoor unit connection cables.

OUTDOOR UNIT/3-PHASE MODEL


Outdoor unit power supply
(ex. 400 3N~)
Indoor/outdoor unit connection power cables
Switch
Fuse
L1
L2
L3
N
Earth
1
2
3
4
A
B
Indoor/outdoor unit connection control cables (non-polar)
1
2
3
4
Indoor unit
Remote control unit (option)
Outdoor unit

OUTDOOR UNIT/SINGLE-PHASE MODEL


Outdoor unit power supply
Indoor/outdoor unit connection power cables
Switch
Fuse
L
N
Earth
1
2
3
4
A
B
Indoor/outdoor unit connection control cables (non-polar)
1
2
3
4
Indoor unit
Remote control unit (option)
Outdoor unit

- Power supply specifications

Model name		Leakage current breaker (A)	Circuit breaker (Minimum Capacity)		Minimum power supply cables	$4mm^2$ cable based on length (m)	Indoor/outdoor unit connection power cables (terminals ① ② ⏚)	Indoor/outdoor unit connection power cables (terminals ① ②)	Maximum permissible impedance (Ω)
			Switch (A)	Fuse (A)					
CU-A24BBP5 CU-C24BBP5 CU-C28BBN5	220V-240V~	30	30	30	$4mm^2$	15	$2.5mm^2$ x 3	$1.0mm^2$ x 2	0.1
CU-C24BBN6	220V~	30	30	30		12			—
CU-A28BBP5 CU-C28BBP5 CU-C28BBN5	220V-240V~	30	30	30		14			0.1
CU-C28BBP6 CU-C28BBN6	220V 3~	30	30	30		11			—
CU-A28BBP8 CU-C28BBP8 CU-C28BBN8	380V-415V 3N~	15	15	15		46			0.05
CU-A34BBP5 CU-C34BBP5	220V-240V~	40	40	40		10			0.05
CU-C34BBP7 CU-C34BBN7	220V 3~	30	30	30		17			—
CU-A34BBP8 CU-C34BBP8 CU-C34BBN8	380V-415V 3N~	20	20	20		36			0.04
CU-C43BBP7 CU-C43BBN7	220V 3~	40	40	40		13			—
CU-A43BBP8 CU-C43BBP8 CU-C43BBN8	380V-415V 3N~	20	20	20		28			0.03
CU-C50BBP7 CU-C50BBN7	220V 3~	50	50	50		11			—
CU-A50BBP8 CU-C50BBP8 CU-C50BBN8	380V-415V 3N~	20	20	20		24			0.02

NOTE

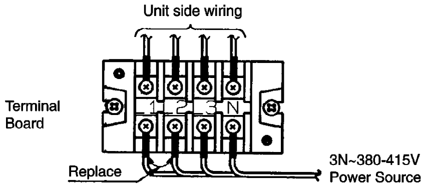
⊘ 1. Where ground work (earth) is carried out, do not connect the ground return to the gas pipe, water line pipe, grounded circuit of the telephone and lightning rod, or ground circuit of other product in which earth leakage breaker is incorporated. (Such action is prohibited by statute, etc.)

⚠ 2. In order to prevent malfunction (noise generation) of the equipment, carry out the wiring of the control cable for indoor and outdoor units (signal cable) isolating it from other power cable with separate cable.

3. Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conforms to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (245IEC57, 245IEC66)
4. Select the particular size of electrical wire for power supply cables in accordance with the standards of the given nation and region.

CONNECTING POWER SUPPLY CABLES

- If reversed phase is detected and the self-diagnosis function is activated after connecting the power supply cables, carry out the following operation.
  Switch over any two of the power supply wires which are connected to the power supply terminal board.
  Turn off the main power supply before correcting the phase.



CAUTION

- Never operate the unit by pressing the electromagnetic switch.
- Never correct the phase by switching over any of the wires inside the unit.

NOTE When installing in Australia

As next enumeration unit is a single phase connection with a starting current greater than 45amps, it will be necessary to fit a starting device that lowers the starting current to no more than 45amps if it causes interference to electricity supply.

Single phase connection with greater than 45 amps unit

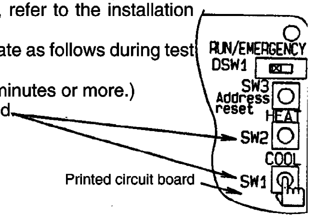
CU-A24BBP5 CU-C24BBP5 CU-A28BBP5 CU-C28BBP5 CU-A34BBP5 CU-C34BBP5

9. PRECAUTIONS WITH REGARD TO TEST OPERATION

CAUTION

- Always be sure to use a properly-insulated tool to operate the switch on the circuit board. (Do not use your finger or a metallic object.)
- Never turn on the power supply until all installation work has been completed.
- Turn on the circuitbreaker 12 hours or more before a test run. (By supplying power to crankcase heater, compressor is warmed and liquid compressing is prevented.)
- For three-phase models, check that the phase is not reversed.
  (If the phase is reversed, the LED on the printed circuit board will flash.)
- Check that the voltage is 90% of rated voltage or higher when starting the unit.
  (The unit will not operate if the voltage is less than 90% of rated voltage.)
- Test operation can be carried out using the remote control unit or by using the switch on the printed circuit board inside the outdoor unit.
  If carrying out test operation at the printed circuit board of the outdoor unit, follow the procedure given below. (If using the remote control unit to carry out test operation, refer to the installation manual which is supplied with the indoor unit.)
- Press the COOL or HEAT switch for 1 second or more. The LEDs will operate as follows during test operation.
  (Be sure to select cooling mode first, and run the units in this mode for 5 minutes or more.)

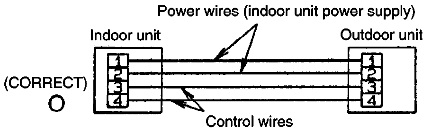
✻ The compressor will stop momentarily when the operation mode is changed.

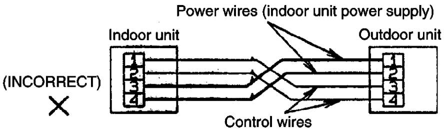


Test operation mode	LEDs on printed circuit board
Cooling test mode	LEDs 2-4 flash, LEDs 5-8 switch off
Heating test mode	LEDs 2-5 switch off, LEDs 6-8 flash

- Press the TEST button once more to cancel test operation mode.
- When performing heating test operation when the outside temperature is high, or cooling test operation when the outside temperature is low, the protection circuits may sometimes operate within a few minutes.

NOTE 1 These units are equipped with connection error prevention circuits. If the units do not operate, it is possible that the connection error prevention circuits have been operated. In such cases, check that the drive wires (connected to terminals ① and ②) and the control wires (connected to terminals ③ and ④) are connected correctly. If they are connected incorrectly, connect them correctly. Normal operation should then commence.





NOTE 2 Do not short the remote control unit wires to each other. (The protection circuit will be activated and the units will not operate.) Once the cause of the short is eliminated, normal operation will then be possible.

NOTE 3 When running the units in heating mode during test operation, be sure to run the units in cooling mode first before selecting this mode. If heating mode is selected first, it may cause problems with operation of the compressor.

NOTE 4 Test operation should be carried out for a minimum of 5 minutes. (Test operation will be cancelled automatically after 30 minutes.)

NOTE 5 Test operation mode should always be cancelled once test operation itself has been completed.

NOTE 6 Emergency operation can be carried out by setting the DSW1 switch on the printed circuit board inside the outdoor unit to the EMERGENCY position. During emergency operation, any abnormalities detected by the temperature thermistors are ignored while the outdoor unit is operating, so that long-term operation in this mode should be avoided. After emergency mode operation has been completed and normal operation is to be resumed, turn the power supplies for the indoor and outdoor units off and then back on again.

- Set the abnormal temperature thermistor only to the setting in the table below when carrying out emergency operation.

	Thermistor	Cooling operation	Heating operation
Indoor unit side	Room temperature detection	Fixed at 25˚C	
	Pipe temperature detection	Shorted	Open
Outdoor unit side	Discharge thermistor detection	Open	Open
	Heat exchanger outlet temperature detection	Shorted	Open

✳ Refer to the electrical circuit diagrams for details on wiring for each thermistor.

NOTE 7 If the self-diagnosis function reports a problem but more than one problem has developed at the indoor and/or outdoor units, the problem display on the remote control unit may not match the LED display on the outdoor unit printed circuit board. In such cases, check both locations and remove the causes of the problems.

10. AS TO MAKING THE INSPECTION AFTER COMPLETION OF WORK FULLY UNDERSTOOD

- At the time when the work has been completed, measure and record the characteristics of test run without fail and keep the measuring date, etc.
- Carry out the measurement regarding room temperature outside air temperature, suction and air discharge temperatures, wind velocity, wind volume, voltage current, presence of abnormal vibration, operating pressure, piping temperature, compressive pressure, airtight pressure as items to be measured.
- As to the structure and appearance, check following items.
  - ☐ Short circuit of the blowout air.
  - ☐ Smooth flow of the drain
  - ☐ Reliable thermal insulation
  - ☐ Leakage of refrigerant
  - ☐ Mistake in wiring
  - ☐ Reliable connection of the grand wire
  - ☐ Looseness in terminal screw, fastening torque
  M3… 69-98•cm{7-10kgf•cm} M4…157-196N•cm{16-20kgf•cm}
  M5…196-245N•cm{20-25kgf•cm}

11. AS TO DELIVERY TO THE CUSTOMER

- Request the customer to operate this air conditioner viewing instruction manual come with indoor unit in practice and explain how to operate.
- Deliver the instruction manual to the customer without fail.

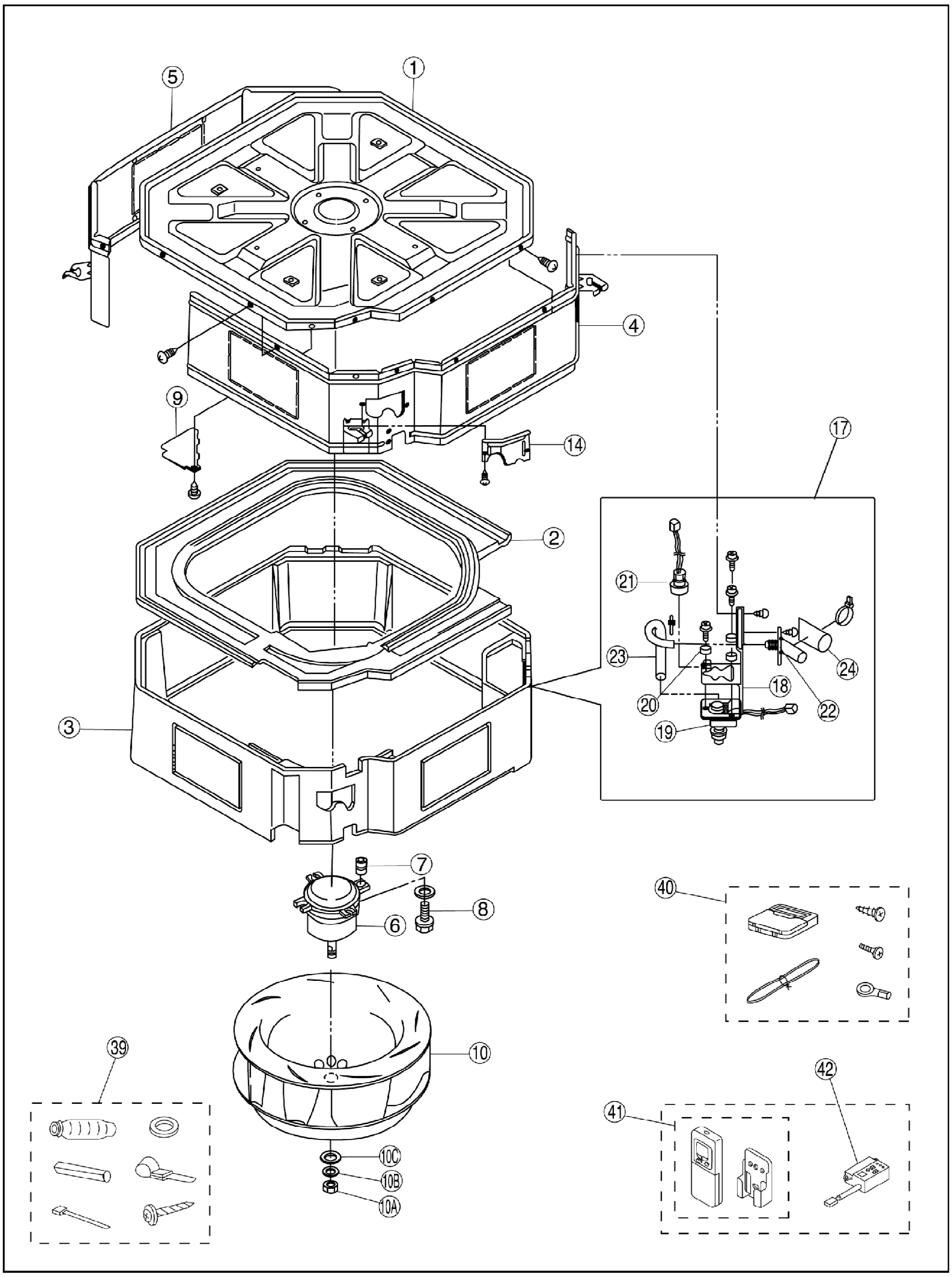
12. AS TO PARTS TO BE SOLD SEPARATELY

We are preparing air guider for outdoor unit and parts to be sold separately for indoor unit, etc., however, as to details of mounting method, etc., observe respective instruction manual.

32. REPLACEMENT PARTS

32.1. INDOOR UNIT

CS-A24BB4P, CS-A28BB4P, CS-A34BB4P, CS-A43BB4P, CS-A50BB4P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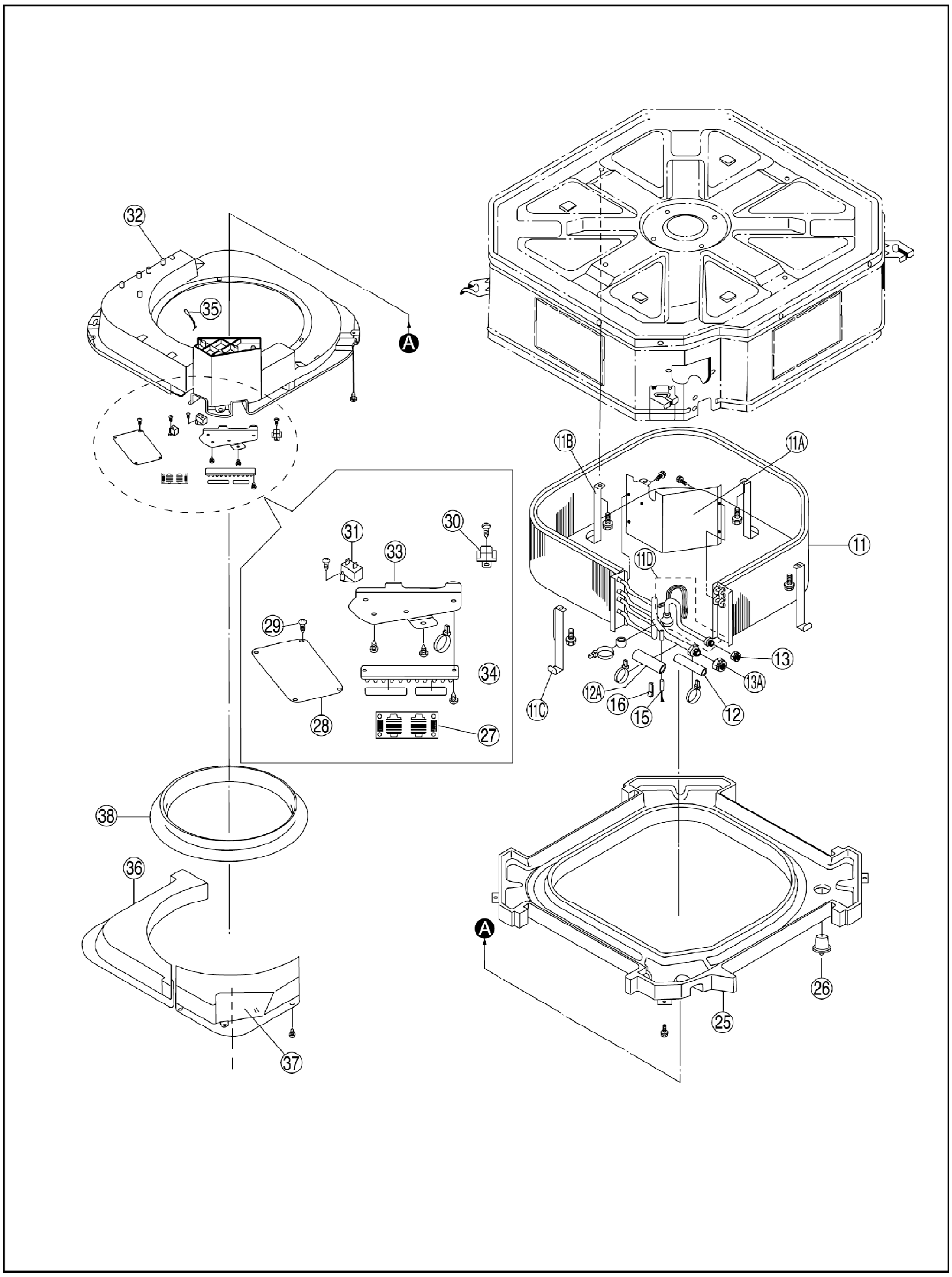
CS-A24BB4P, CS-A28BB4P, CS-A34BB4P, CS-A43BB4P, CS-A50BB4P



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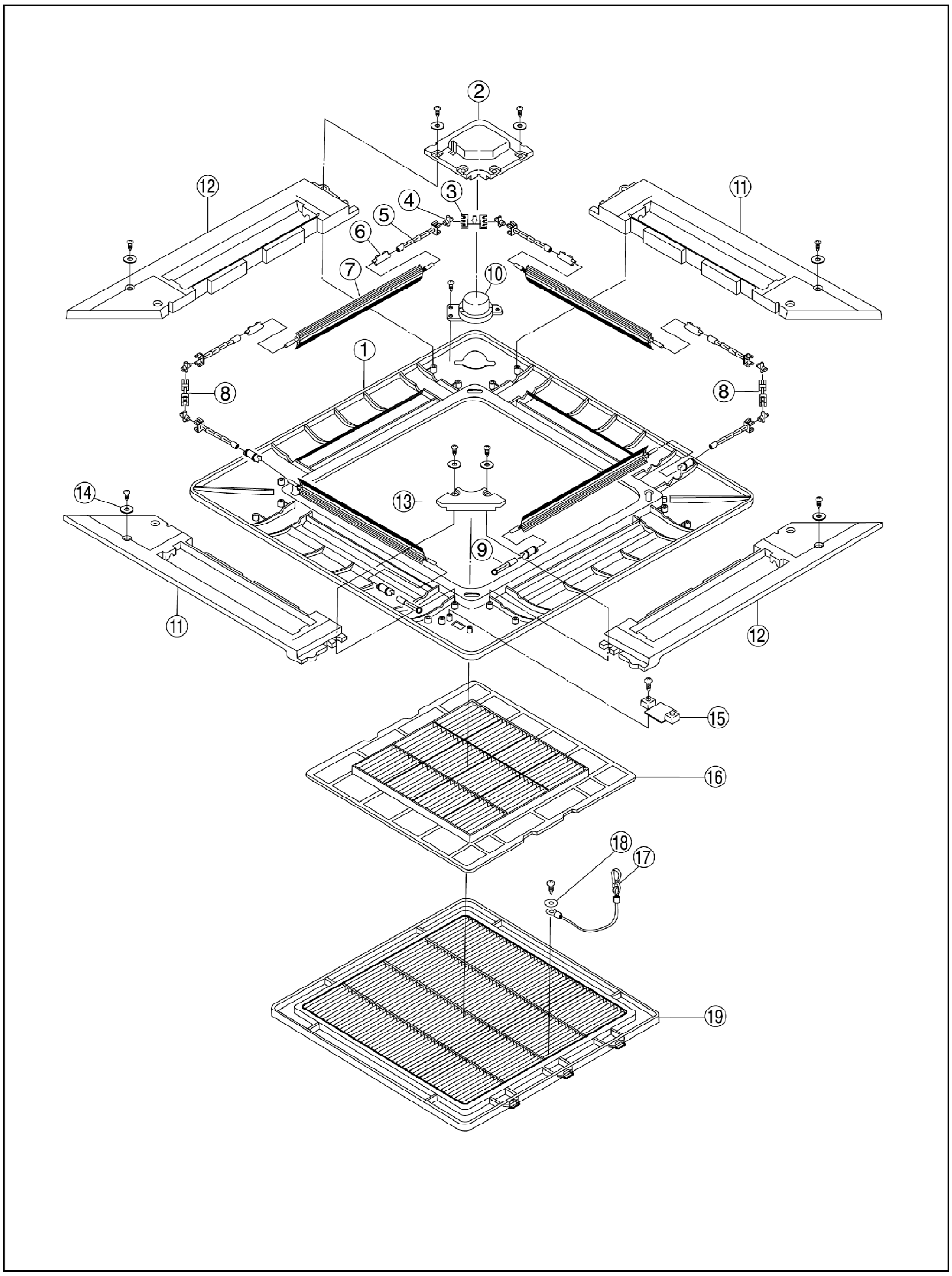
NO.	PART DESCRIPTION	QTY.	CS-A24BB4P	CS-A28BB4P	CS-A34BB4P	CS-A43BB4P	CS-A50BB4P
1	BASE PAN ASS’Y	1	CWD52K1034	←	←	←	←
2	INNER POLYSTYRENE (TOP)	1	CWG071049	←	CWG071057	←	←
3	INNER POLYSTYRENE (SIDE)	1	CWG07C1016	←	CWG07C1017	←	←
4	CABINET SIDE PLATE ASS’Y	1	CWE04K1001	←	CWE04K1003	←	←
5	CABINET SIDE PLATE ASS’Y	1	CWE04K1002	←	CWE04K1004	←	←
6	FAN MOTOR	1	CWA921049	←	CWA921050	CWA921051	←
7	ANTI-VIBRATION BUSHING	4	CWH501016	←	←	←	←
8	SCREW-FAN MOTOR	4	CWH551032	←	←	←	←
9	CORD HOLDER	1	CWD74K1001	←	←	←	←
10	TURBO FAN	1	CWH03K1003	←	←	←	←
10a	NUT for TURBO FAN	1	XNG8	←	←	←	←
10b	SP WASHER	1	XWA8	←	←	←	←
10c	WASHER	1	CWH571008	←	←	←	←
11	EVAPORATOR	1	CWB30C1112	CWB30C1113	CWB30C1117	CWB30C1118	←
11a	EVAPORATOR SUPPORTER	1	CWD911115	←	CWD911116	←	←
11b	EVAPORATOR HOLDER	1	CWD911136	←	CWD911137	CWD911138	←
11c	EVAPORATOR HOLDER	1	-	-	CWD911127	CWD911128	←
11d	TUBE ASS’Y (CAPIL. TUBE-EVA)	1	CWT07K1028	CWT07K1018	CWT07K1019	CWT07K1020	←
12	HEATPROOF TUBE (24)	1	CWG021023	←	←	←	←
12a	HEATPROOF TUBE	1	CWG021021	←	←	←	←
13	FLARE NUT / (3/8”) / (1/4”)	1	6002140 / (1/4”)	CWT25005 / (3/8”)	←	←	←
13a	FLARE NUT / (6/8”) / (5/8”)	1	CWT25004 / (5/8”)	←	CWT251012 / (6/8”)	←	←
14	PIPE COVER	1	CWD93C1020	←	←	←	←
15	SENSOR-EVAPORATOR	1	CWA501047	←	←	←	←
16	SPRING FOR SENSOR	1	CWH711010	←	←	←	←
17	DRAIN PUMP COMPLETE	1	CWB53C1003	←	CWB53C1004	←	←

18	PANEL DRAIN PUMP ASS'Y	1	CWD93K1004	←	CWD93K1005	←	←
19	DRAIN PUMP	1	CWB532005	←	←	←	←
20	ANTI-VIBRATION BUSHING	3	CWH501017	←	←	←	←
21	FLOAT SWITCH - DRAIN PUMP	1	CWA121076	←	←	←	←
22	DRAIN NOZZLE	1	CWH411005	←	←	←	←
23	FLEXIBLE PIPE	1	CWH851030	←	←	←	←
24	DRAIN HOSE HEAT INSULATION	1	CWG101025	←	←	←	←
25	DRAIN PAN-COMPLETE	1	CWH40C1018	←	CWH40C1019	←	←
26	DRAIN PLUG	1	CWB82018	←	←	←	←
27	NOISE FILTER	1	CWA491018	←	←	←	←
28	ELECTRONIC CONTROLLER	1	CWA742528	←	←	←	←
29	SPACER	6	CWH541028	←	←	←	←
30	TRANSFORMER	1	CWA401028	←	←	←	←
31	CAPACITOR-FAN MOTOR (MF/V)	1	DS461155QP-A (1.5/460)	DS461185QP-A (1.8/460)	DS461255QP-A (2.5/460)	DS461305QP-A (3/460)	←
32	CONTROL BOARD	1	CWH141005	←	←	←	←
33	HOLDER-TERMINAL BOARD	1	CWD932155	←	←	←	←
34	TERMINAL BOARD	1	CWA281015	←	←	←	←
35	LEADWIRE-FUSE&SENSOR	1	CWA67C3691	←	←	←	←
36	CONTROL BOARD COVER[CAUTION]	1	CWH13C1042	←	←	←	←
37	CONT. BOARD COVER-WIRING DIAG.	1	CWH13C1043	←	←	←	←
38	AIR GUIDER BLOWER WHEEL	1	CWD321030	←	CWD321031	←	←
39	ACCESSORY COMPLETE	1	CWH82C1106	←	CWH82C1107	←	←
40	WIRED REMOTE CONTROL COMPLETE	1	CWA75C2239	←	←	←	←
41	WIRELESS R/CONTROL COMP. (HP)	1	CWA75C2247	←	←	←	←
41	WIRELESS R/CONTROL COMP. (C)	1	CWA75C2250	←	←	←	←

42	RAY RECEIVER (HEAT PUMP MODEL)	1	CWD76C1003	←	←	←	←
42	RAY RECEIVER (COOLING ONLY)	1	CWD76C1002	←	←	←	←
	OPERATING INSTRUCTION	1	CWF563424	←	←	←	←
	INSTALLATION INSTRUCTION	1	CWF612230	←	←	←	←

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

CS-A24BB4P, CS-A28BB4P, CS-A34BB4P, CS-A43BB4P, CS-A50BB4P

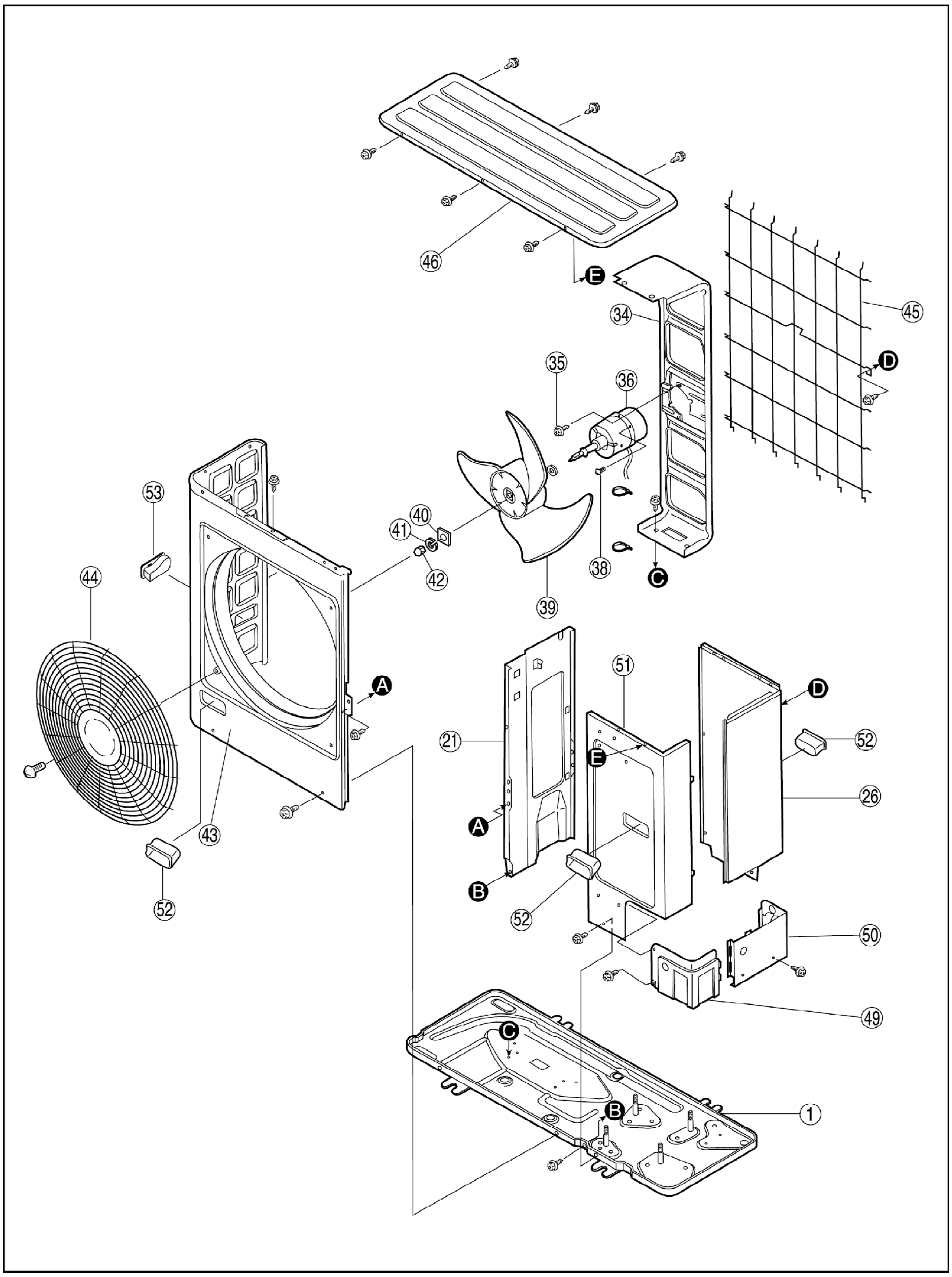


NO.	PART DESCRIPTION	PART NO.	QTY.
1	FRONT GRILLE	CWE121026	1
2	COVER-AIR SWING MOTOR	CWH811013	1
3	CONNECTOR-SHAFT	CWH081002	1
4	CONNECTOR-SHAFT	CWH081003	6
5	CONNECTOR-SHAFT	CWH081004	6
6	BEARING	CWH641006	8
7	VANE	CWE241103	4
8	CONNECTOR-SHAFT	CWH081005	2
9	CONNECTOR-SHAFT	CWH081006	2
10	AIR SWING MOTOR	CWA981065	1
11	INSULATION POLYSTYRENE	CWG071105	2
12	INSULATION POLYSTYRENE	CWG071106	2
13	INSULATION POLYSTYRENE	CWG071107	1
14	WASHER	CWH571025	16
15	COVER	CWD932215	1
16	AIR FILTER	CWD001072	1
17	STRING	CWH841002	2
18	WASHER	CWH571026	2
19	INTAKE GRILLE	CWE221067	1

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

32.2. OUTDOOR UNIT

CU-A24BBP5, CU-C24BBP5, CU-A28BBP5, CU-A28BBP8, CU-C28BBP5, CU-C28BBP6, CU-C28BBP8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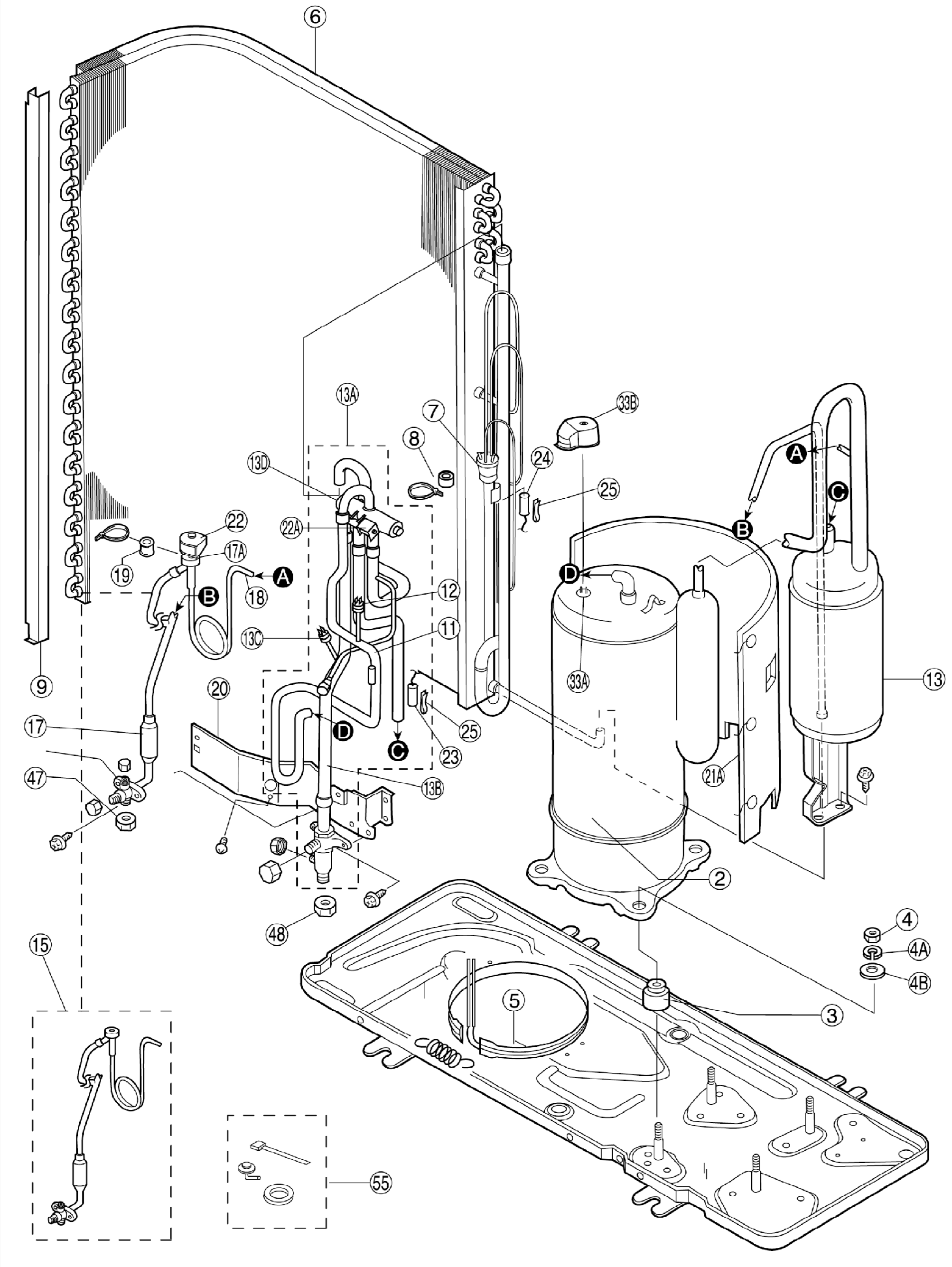
CU-A24BBP5, CU-A28BBP5, CU-A28BBP8 (Heat pump type)



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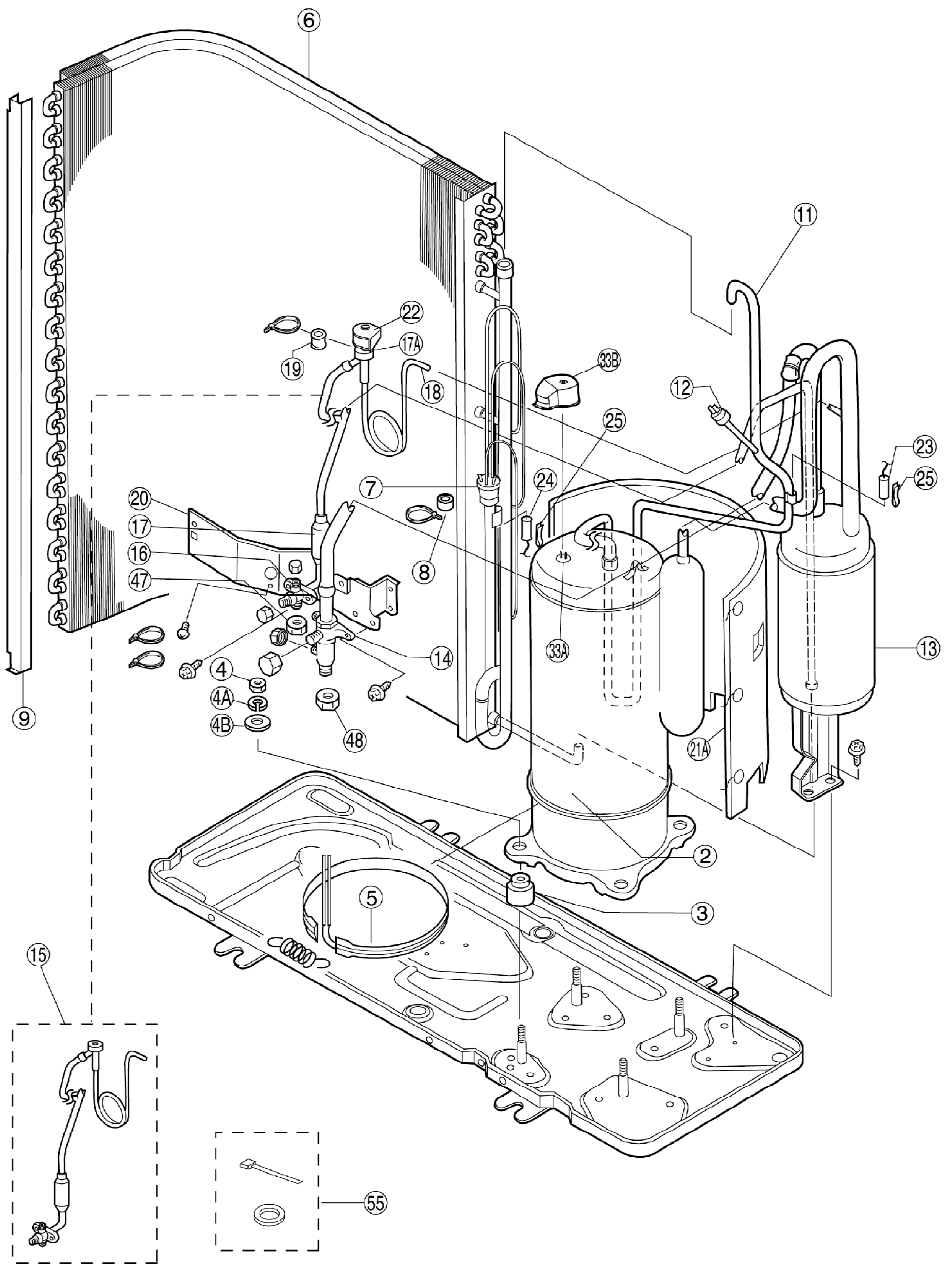
CU-C24BBP5, CU-C28BBP5, CU-C28BBP6, CU-C28BBP8 (Cooling only type)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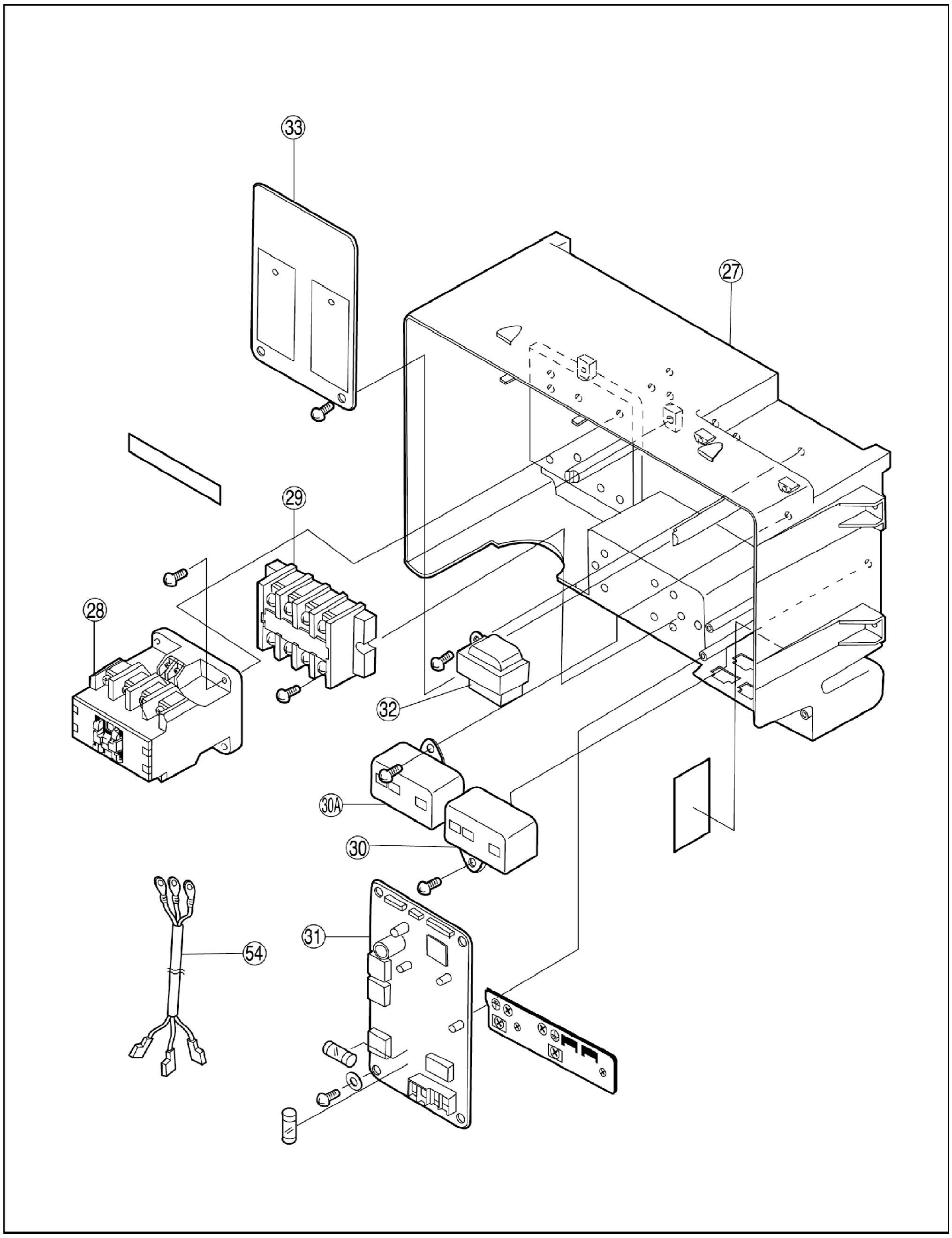
CU-A24BBP5, CU-C24BBP5, CU-A28BBP5, CU-A28BBP8, CU-C28BBP5, CU-C28BBP6, CU-C28BBP8



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NO.	PART DESCRIPTION	QTY.	CU-A24BBP5	CU-A28BBP5	CU-A28BBP8
1	BASE PAN ASS'Y	1	CWD52K1038A	←	←
2	COMPRESSOR	1	NH41VNDT	NH44VNDT	NH44YDET
3	ANTI-VIBRATION BUSHING	4	CWH501018	←	←
4	NUT FOR COMP. MOUNT.	3	XNG8	←	←
4a	WASHER for COMPRESSOR	3	XWA8	←	←
4b	SP WASHER	3	CWH571018	←	←
5	CRANKCASE HEATER	1	CWA341005	←	←
6	CONDENSER COMPLETE	1	CWB32C1088	CWB32C1089	←
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1045	CWT07K1046	←
8	PIPE HOLDER RUBBER	1	CWG251016	←	←
9	CONDENSER SIDE PLATE	1	CWD911122	←	←
11	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022355	←	←
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←
13	ACCUMULATOR	1	CWB131007A	CWB131008A	←
13a	4-WAYS VALVE COMPLETE	1	CWB00C1002	CWB00C1003	←
13b	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT01C2285	←	←
13c	HEATING PRESSURE SWITCH	1	CWA101001	←	←
13d	4-WAYS VALVE	1	CWB00003	←	←
15	TUBE ASS'Y(VALVE+STRAINER)	1	CWT01C2282	CWT01C2283	←
16	3-WAYS VALVE	1	CWB011054	CWB011053	←
17	STRAINER	1	CWB111006	CWB111005	←
17a	2-WAYS VALVE	1	CWB02299	←	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1038	CWB15K1037	←
19	PIPE HOLDER RUBBER	1	CWG251014	CWG251015	←
20	HOLDER-SERVICE VALVE	1	CWD911124	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH151016	←	←
21a	SOUND PROOF MATERIAL-COMP	1	CWG302098	←	←
22	V-COIL COMPLETE	1	CWA43C2068	←	←

22a	V-COIL COMPLETE (4 WAY VALVE)	1	CWA43C2060	←	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501042	←	←
24	PIPING SENSOR (COIL)	1	CWA501043	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←
26	CABINET REAR PLATE	1	CWE02C1005	←	←
27	CONTROL BOARD	1	CWH141004	←	←
28	COMPRESSOR RELAY	1	CWA001005	←	CWA001007
29	TERMINAL BOARD ASS’Y	1	CWA28K1027	←	CWA28K1029
30	CAPACITOR-FAN MOTOR (3 / 460)	1	DS461305QP-A	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS441456CPNB / (45 / 440)	DS441506CPNB / (50 / 440)	-
31	ELECTRONIC CONTROLLER	1	CWA742583	←	CWA742584
32	TRANSFORMER	1	CWA401029	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742591	←	CWA742592
33a	OVERLOAD PROTECTOR	1	-	-	CWA121075
33b	TERMINAL COVER	1	CWH171019	←	CWH171022
34	BRACKET FAN MOTOR	1	CWD541027	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←
36	FAN MOTOR	1	CWA951077	←	←
38	SCREW-FAN MOTOR	4	CWH55442	←	←
39	PROPELLER FAN	1	CWH001007	←	←
40	WASHER for P.FAN	1	CWH571013	←	←
41	SPRING WASHER for P.FAN	1	XWB10B	←	←
42	NUT for PROPELLER FAN	1	CWH56033	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061036A	←	←
44	FAN GUARD	1	CWD041014A	←	←
45	CONDENSER GUARD	1	CWD041015A	←	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	←
47	FLARE NUT (1/4”) / (3/8”)	1	6002140 (1/4”)	CWT25005 (3/8”)	←
48	FLARE NUT (5/8”)	1	CWT25004	←	←

49	PIPE COVER (FRONT)	1	CWD601017A	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←
51	CABINET FRONT PLATE	1	CWE06C1033	←	←
52	HANDLE	3	CWE161008	←	←
53	HANDLE	1	CWE161009	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3657	←	CWA67C3665
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←
	INSTALLATION INSTRUCTION	1	CWF612231	←	←

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

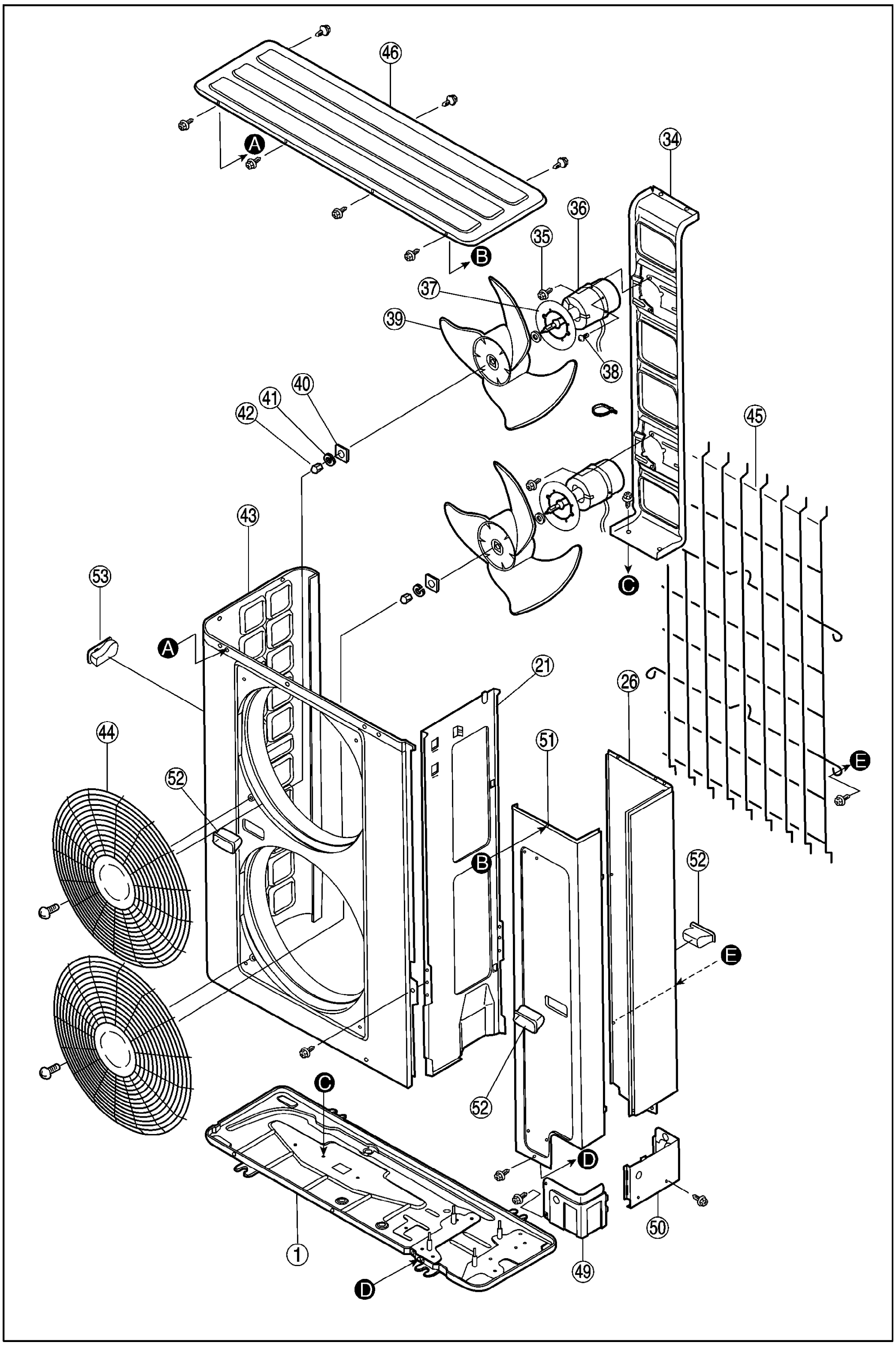
NO.	PART DESCRIPTION	QTY.	CU-C24BBP5	CU-C28BBP5	CU-C28BBP6	CU-C28BBP8
1	BASE PAN ASS’Y	1	CWD52K1038A	←	←	←
2	COMPRESSOR	1	NH41VNDT	NH44VNDT	NH44NADT	NH44YDET
3	ANTI-VIBRATION BUSHING	4	CWH501018	←	←	←
4	NUT FOR COMP. MOUNT.	3	XNG8	←	←	←
4a	WASHER for COMPRESSOR	3	XWA8	←	←	←
4b	SP WASHER	3	CWH571018	←	←	←
5	CRANKCASE HEATER	1	CWA341005	←	←	←
6	CONDENSER COMPLETE	1	CWB32C1091	←	←	←
7	TUBE ASS’Y (CAPILLARY TUBE)	1	CWT07K1024	←	←	←
8	PIPE HOLDER RUBBER	1	CWG251016	←	←	←
9	CONDENSER SIDE PLATE	1	CWD911122	←	←	←
11	TUBE ASS’Y(PRESSURE SWITCH)	1	CWT022364	←	←	←
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←	←
13	ACCUMULATOR	1	CWB131007A	CWB131008A	←	←
14	TUBE ASS’Y(3 WAYS VALVE)	1	CWT022362	CWT022363	←	←
15	TUBE ASS’Y(VALVE+STRAINER)	1	CWT01C2282	CWT01C2283	←	←
16	3-WAYS VALVE	1	CWB011054	CWB011053	←	←
17	STRAINER	1	CWB111006	CWB111005	←	←

17a	2-WAYS VALVE	1	CWB02299	←	←	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1038	CWB15K1037	←	←
19	PIPE HOLDER RUBBER	1	CWG251014	CWG251015	←	←
20	HOLDER-SERVICE VALVE	1	CWD911124	←	-	CWD911124
21	SOUND-PROOF BOARD ASS’Y	1	CWH151016	←	←	←
21a	SOUND PROOF MATERIAL-COMP	1	CWG302098	←	←	←
22	V-COIL COMPLETE	1	CWA43C2068	←	←	←
23	PIPING SENSOR (DISCHARGE)	1	CWA501042	←	←	←
24	PIPING SENSOR (COIL)	1	CWA501043	←	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←	←
26	CABINET REAR PLATE	1	CWE02C1005	←	←	←
27	CONTROL BOARD	1	CWH141004	←	←	←
28	COMPRESSOR RELAY	1	CWA001005	←	←	CWA001007
29	TERMINAL BOARD ASS’Y	1	CWA28K1027	←	←	CWA28K1029
30	CAPACITOR-FAN MOTOR (3 / 460)	1	DS461305QP-A	←	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS441456CPNB / (45 / 370)	DS441506CPNB / (50 / 440)	DS371556CPNA / (55 / 370)	-
31	ELECTRONIC CONTROLLER	1	CWA742587	←	←	CWA742588
32	TRANSFORMER	1	CWA401029	←	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742591	←	←	CWA742592
33a	OVERLOAD PROTECTOR	1	-	-	-	CWA121075
33b	TERMINAL COVER	1	CWH171019	←	←	CWH171022
34	BRACKET FAN MOTOR	1	CWD541027	←	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←	←
36	FAN MOTOR	1	CWA951077	←	←	←
38	SCREW-FAN MOTOR	4	CWH55442	←	←	←
39	PROPELLER FAN	1	CWH001007	←	←	←
40	WASHER for P.FAN	1	CWH571013	←	←	←
41	SPRING WASHER for P.FAN	1	XWB10B	←	←	←
42	NUT for PROPELLER FAN	1	CWH56033	←	←	←

43	P.FAN AIR GUIDER PLATE	1	CWE061036A	←	←	←
44	FAN GUARD	1	CWD041014A	←	←	←
45	CONDENSER GUARD	1	CWD041015A	←	←	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	←	←
47	FLARE NUT (1/4”) / (3/8”)	1	6002140 (1/4”)	CWT25005 (3/8”)	←	←
48	FLARE NUT (5/8”)	1	CWT25004	←	←	←
49	PIPE COVER (FRONT)	1	CWD601017A	←	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←	←
51	CABINET FRONT PLATE	1	CWE06C1033	←	←	←
52	HANDLE	3	CWE161008	←	←	←
52	HANDLE	1	CWE161009	←	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3657	←	←	CWA67C3665
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←	←
	INSTALLATION INSTRUCTION	1	CWF612231	←	←	←

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

CU-A34BBP5, CU-A34BBP8, CU-C34BBP5, CU-C34BBP7, CU-C34BBP8, CU-A43BBP8, CU-C43BBP7,
CU-C43BBP8, CU-A50BBP8, CU-C50BBP7, CU-C50BBP8



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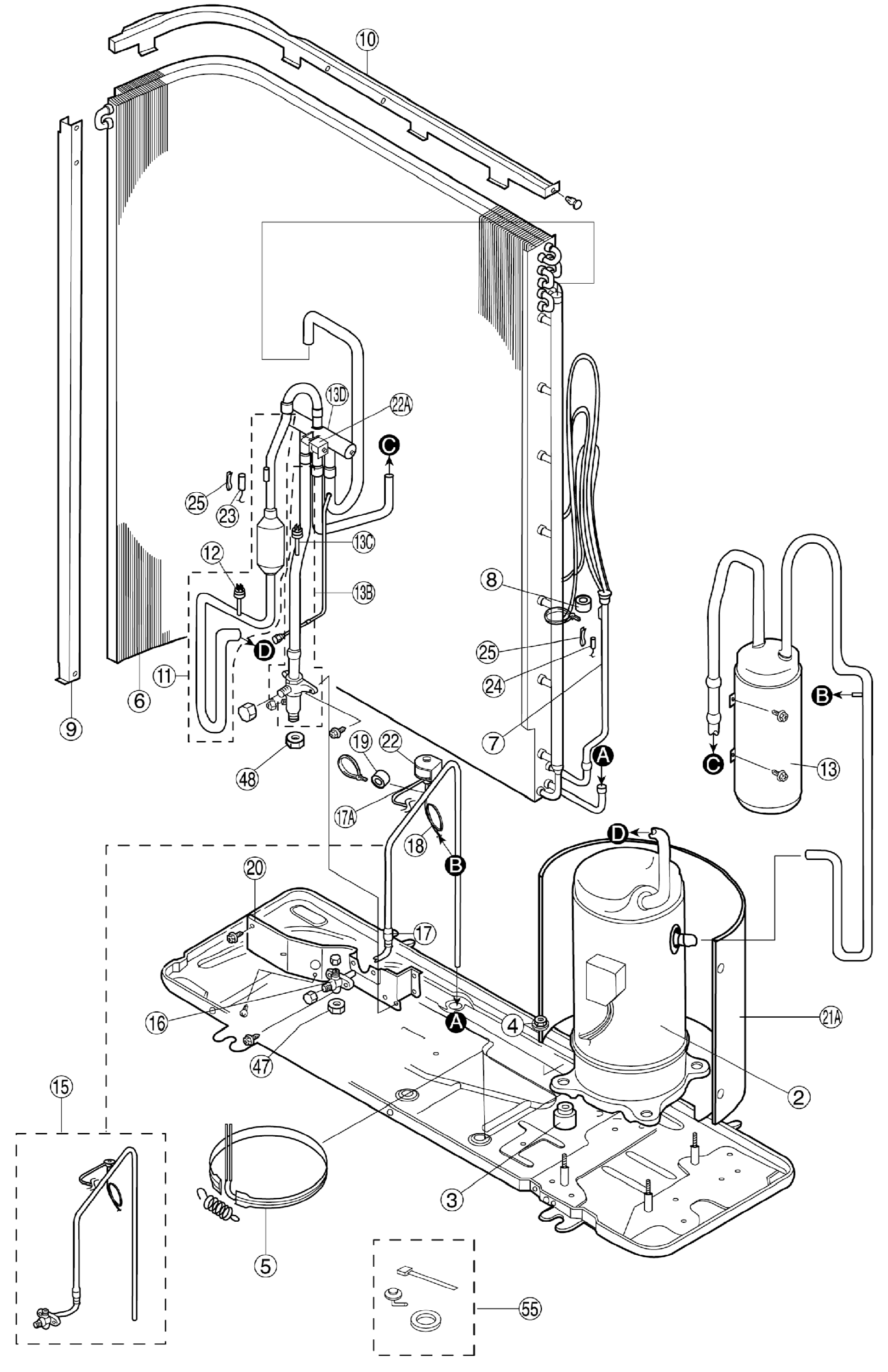
CU-A34BBP5, CU-A34BBP8, CU-A43BBP8, CU-A50BBP8 (Heat pump type)



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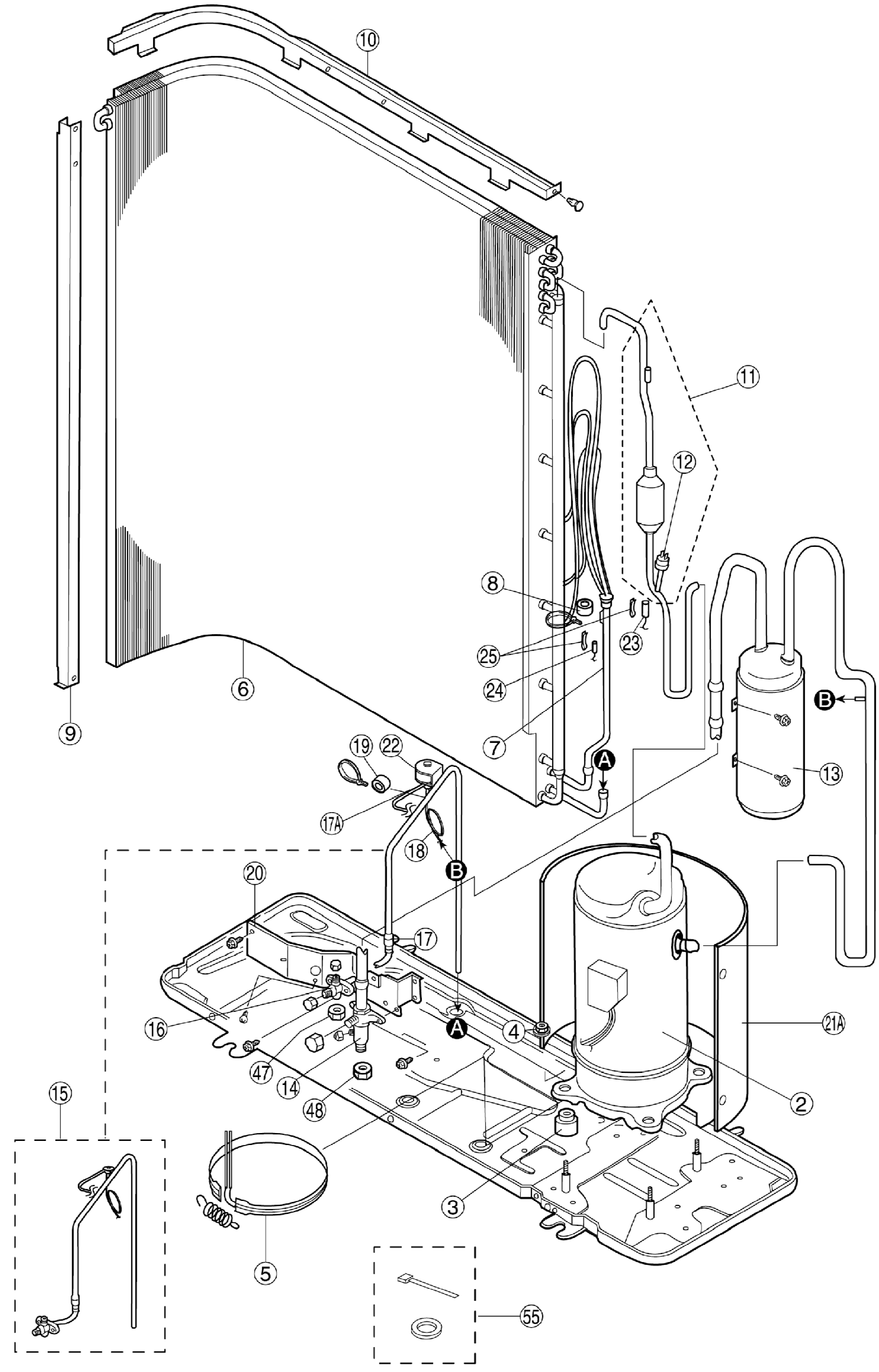
CU-C34BBP5, CU-C34BBP7, CU-C34BBP8, CU-C43BBP7, CU-C43BBP8, CU-C50BBP7, CU-C50BBP8 (Cooling only type)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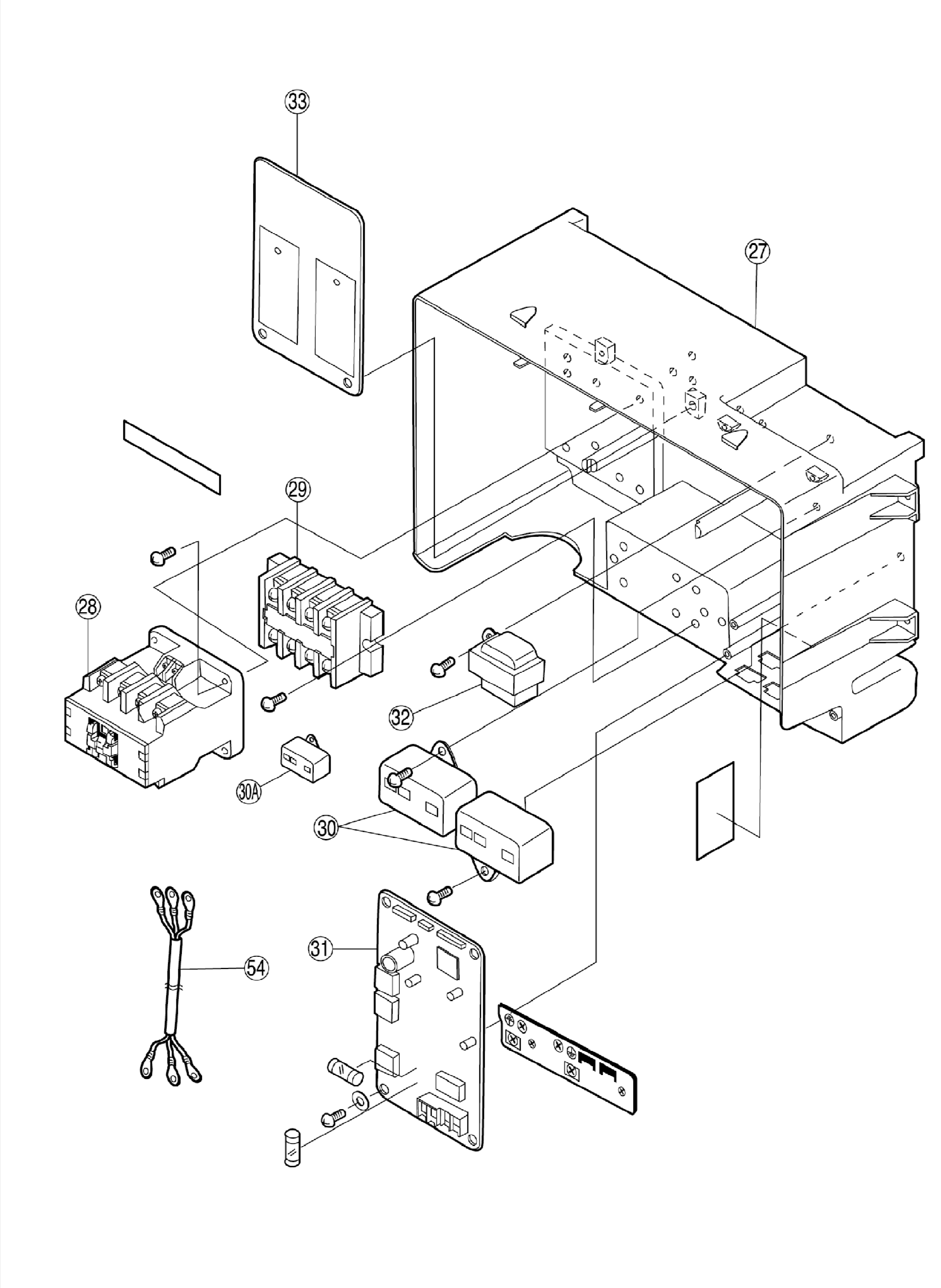
CU-A34BBP5, CU-A34BBP8, CU-C34BBP5, CU-C34BBP7, CU-C34BBP8, CU-A43BBP8, CU-C43BBP7, CU-C43BBP8, CU-A50BBP8, CU-C50BBP7, CU-C50BBP8



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NO.	PART DESCRIPTION	QTY.	CU-A34BBP5	CU-A34BBP8	CU-A43BBP8	CU-A50BBP8
1	BASE PAN ASS'Y	1	CWD52K1039A	←	CWD52K1040A	←
2	COMPRESSOR	1	ZR47K3PFJ522	ZR45KCTFD522	ZR57KCTFD599	ZR68KCTFD599
3	ANTI-VIBRATION BUSHING	4	CWH501020	←	←	←
4	NUT FOR COMP. MOUNT.	3	4582065	←	←	←
5	CRANKCASE HEATER	1	CWA341004	←	CWA341002	←
6	CONDENSER COMPLETE	1	CWB32C1094	←	CWB32C1095	CWB32C1096
7	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1023	←	CWT07K1048	CWT07K1049
8	PIPE HOLDER RUBBER	1	CWG251016	←	CWG251021	←
9	CONDENSER SIDE PLATE	1	CWD911123	←	←	←
10	CONDENSER TOP PLATE	1	CWD911132	←	CWD911133	←
11	TUBE ASS'Y(PRESSURE SWITCH)	1	CWT022371	←	CWT022374	←
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←	←
13	ACCUMULATOR	1	CWB131009A	←	CWB131011A	CWB131012A
13b	TUBE ASS'Y(PRESS.SW + VALVE)	1	CWT022370	←	CWT022373	←
13c	HEATING PRESSURE SWITCH		CWA101001	←	←	←
13d	4-WAYS VALVE	1	CWB001014	←	CWB001015	←
15	TUBE ASS'Y(VALVE+STRAINER)	1	CWT022359	←	CWT022360	CWT022361
16	3-WAYS VALVE		CWB011058	←	←	←
17	STRAINER		CWB111005	←	←	←
17a	2-WAYS VALVE		CWB02299	←	←	←
18	CAPILLARY TUBE for VALVE	1	CWB15K1037	←	CWB15K1039	CWB15K1040
19	PIPE HOLDER RUBBER	1	CWG251015	←	←	←
20	HOLDER-SERVICE VALVE	1	CWD911131	←	←	←
21	SOUND-PROOF BOARD ASS'Y	1	CWH15K1001	←	←	←
21a	SOUND PROOF MATERIAL-COMP.	1	CWG302101	←	CWG302103	←
22	V-COIL COMPLETE	1	CWA43C2067	←	←	←
22a	V-COIL COMPLETE-4 WAY VALVE	1	CWA43C2063	←	←	←

23	PIPING SENSOR (DISCHARGE)	1	CWA501044	←	←	←
24	PIPING SENSOR (COIL)	1	CWA501045	←	←	←
25	SPRING FOR SENSOR	2	CWH711010	←	←	←
26	CABINET REAR PLATE	1	CWE021012A	←	CWE02C1006	←
27	CONTROL BOARD	1	CWH141004	←	←	←
28	COMPRESSOR RELAY	1	CWA001006	CWA001005	←	←
29	TERMINAL BOARD ASS'Y	1	CWA28K1027	CWA28K1029	←	←
30	CAPACITOR-FAN MOTOR (3 / 460)	2	DS461305QP-A	←	←	←
30a	CAPACITOR-COMP (MF/V)	1	DS371606CPNA (60 / 370)	-	-	-
31	ELECTRONIC CONTROLLER	1	CWA742590	CWA742585	←	←
32	TRANSFORMER	1	CWA401029	←	←	←
33	CURRENT TRANSFORMER BOARD	1	CWA742591	CWA742592	←	←
34	BRACKET-FAN MOTOR	1	CWD541028	←	←	←
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←	←
36	FAN MOTOR	2	CWA951077	←	←	CWA951078
37	FAN MOTOR SUPPORTER	2	-	←	←	CWD932142
38	SCREW-FAN MOTOR	8	CWH55442	←	←	←
39	PROPELLER FAN	2	CWH001007	←	←	←
40	WASHER for P.FAN	2	CWH571013	←	←	←
41	SPRING WASHER for P.FAN	2	XWB10B	←	←	←
42	NUT for PROPELLER FAN	2	CWH56033	←	←	←
43	P.FAN AIR GUIDER PLATE	1	CWE061042A	←	CWE061044A	←
44	FAN GUARD	2	CWD041014A	←	←	←
45	CONDENSER GUARD	1	CWD041016A	←	CWD041017A	←
46	CABINET TOP PLATE COMPLETE	1	CWE03C1004	←	CWE03C1005	←
47	FLARE NUT (3/8")	1	CWT25005	←	←	←
48	FLARE NUT (6/8")	1	CWT251012	←	←	←
49	PIPE COVER (FRONT)	1	CWD601017A	←	←	←
50	PIPE COVER (BACK)	1	CWD601018A	←	←	←

51	CABINET FRONT PLATE	1	CWE061046A	←	←	←
52	HANDLE	3	CWE161008	←	←	←
53	HANDLE	1	CWE161009	←	←	←
54	LEADWIRE-COMPRESSOR	1	CWA67C3876	CWA67C3656	←	←
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←	←
	INSTALLATION INSTRUCTION	1	CWF612231	←	←	←

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

NO.	PART DESCRIPTION	QTY.	CU-C34BBP5	CU-C34BBP7	CU-C34BBP8	CU-C43BBP7	CU-C43BBP8	CU-C
1	BASE PAN ASS'Y	1	CWD52K1039A	←	←	CWD52K1040A	←	
2	COMPRESSOR	1	ZR47K3PFJ522	ZR45KCTF5522	ZR45KCTFD522	ZR57KCTF5599	ZR57KCTFD599	ZR68K
3	ANTI-VIBRATION BUSHING	4	CWH501020	←	←	←	←	
4	NUT FOR COMP. MOUNT.	3	CW4582065	←	←	←	←	
5	CRANKCASE HEATER	1	CWA341004	←	←	CWA341002	←	
6	CONDENSER COMPLETE	1	CWB32C1093	←	←	CWB32C1097	←	
7	TUBE ASS'Y / (CAPILLARY TUBE)	1	CWT07K1025	←	←	CWT07K1021	←	
8	PIPE HOLDER RUBBER	1	CWG251016	←	←	CWG251021	←	
8	PIPE HOLDER RUBBER	1	CWG251015	←	←	←	←	
9	CONDENSER SIDE PLATE	1	CWD911123	←	←	←	←	
10	CONDENSER TOP PLATE	1	CWD911132	←	←	CWD911133	←	
11	TUBE ASS'Y (PRESSURE SW+ RCVR)	1	CWT022366	←	←	CWT022377	←	
12	HIGH PRESSURE SWITCH	1	CWA101002	←	←	←	←	
13	ACCUMULATOR	1	CWB131009A	←	←	CWB131011A	←	CWB
14	TUBE ASS'Y / (3 WAY VALVE-GAS)	1	CWT022365	←	←	CWT022367	←	CWT
15	TUBE ASS'Y(VALVE+ STRAINER)	1	CWT022359	←	←	CWT022360	←	CWT
16	3-WAYS VALVE	1	CWB011058	←	←	←	←	
17	STRAINER	1	CWB111005	←	←	←	←	

17a	2-WAYS VALVE	1	CWB02299	←	←	←	←	
18	CAPILLARY TUBE for VALVE	1	CWB15K1037	←	←	CWB15K1039	←	CWB
19	PIPE HOLDER RUBBER	1	CWG251015	←	←	←	←	
20	HOLDER-SERVICE VALVE	1	-	-	-	-	-	CWD
21	SOUND-PROOF BOARD ASS'Y	1	CWH15K1001	←	←	←	←	
21a	SOUND PROOF MATERIAL-COMP.	1	CWG302101	←	←	CWG302103	←	
22	V-COIL COMPLETE	1	CWA43C2067	CWA43C2066	CWA43C2067	CWA43C2066	CWA43C2067	CWA
23	PIPING SENSOR / (DISCHARGE)	1	CWA501044	←	←	←	←	
24	PIPING SENSOR (COIL)	1	CWA501045	←	←	←	←	
25	SPRING FOR SENSOR	2	CWH711010	←	←	←	←	
26	CABINET REAR PLATE	1	CWE021012A	←	←	←	←	
27	CONTROL BOARD	1	CWH141004	←	←	←	←	
28	COMPRESSOR RELAY	1	CWA001006	CWA001005	←	CWA001006	CWA001005	CWA
29	TERMINAL BOARD ASS'Y	1	CWA28K1027	CWA28K1028	CWA28K1029	CWA28K1028	CWA28K1029	CWA
30	CAPACITOR-FAN MOTOR / (3 / 460)	2	DS461305QP-A	←	←	←	←	
30a	CAPACITOR-COMP (MF/V)	1	DS371606CPNA (60 / 370)	-	-	-	-	
31	ELECTRONIC CONTROLLER	1	CWA742589	CWA742586	←	←	←	
32	TRANSFORMER	1	CWA401029	←	←	←	←	
33	CURRENT TRANSFORMER BOARD	1	CWA742591	←	CWA742592	CWA742591	CWA742592	CWA
34	BRACKET FAN MOTOR	1	CWD541028	←	←	←	←	
35	SCREW-BRACKET FAN MOTOR	4	CWH551040	←	←	←	←	
36	FAN MOTOR	2	CWA951077	←	←	←	←	CWA
37	FAN MOTOR SUPPORTER	2	-	-	-	-	-	CWD
38	SCREW-FAN MOTOR	8	CWH55442	←	←	←	←	
39	PROPELLER FAN	2	CWH001007	←	←	←	←	
40	WASHER for P.FAN	2	CWH571013	←	←	←	←	

41	SPRING WASHER for P.FAN	2	XWB10B	←	←	←	←	
42	NUT for PROPELLER FAN	2	CWH56033	←	←	←	←	
43	P.FAN AIR GUIDER PLATE	1	CWE061042A	←	←	CWE061044A	←	
44	FAN GUARD	2	CWD041014A	←	←	←	←	
45	CONDENSER GUARD	1	CWD041016A	←	←	CWD041017A	←	
46	CABINET TOP PLATE / COMPLETE	1	CWE03C1004	←	←	CWE03C1005	←	
47	FLARE NUT (3/8”)	1	CWT25005	←	←	←	←	
48	FLARE NUT (6/8”)	1	CWT251012	←	←	←	←	
49	PIPE COVER (FRONT)	1	CWD601017A	←	←	←	←	
50	PIPE COVER (BACK)	1	CWD601018A	←	←	←	←	
51	CABINET FRONT PLATE	1	CWE061046A	←	←	←	←	
52	HANDLE	3	CWE161008	←	←	←	←	
53	HANDLE	1	CWE161009	←	←	←	←	
54	LEADWIRE-COMPRESSOR	1	CWA67C3876	CWA67C3656	←	CWA67C3660	CWA67C3656	CWA
55	ACCESSORY COMPLETE	1	CWH82C1105	←	←	←	←	
	INSTALLATION INSTRUCTION	1	CWF612231	←	←	←	←	

All parts are supplied from MACC, Malaysia (Vendor Code: 086)

33. HEATING CAPACITY PERFORMANCE DATA

Model (CS-)	Power Source	Inlet Air		Outdoor Temperature (°C W.					
		External Static Pressure (Pa) Air Volume (m3/min)	Entering Air Dry Bulb (°C)	-6 °C		0 °C		6 °C	
				H.C.	IPT	H.C.	IPT	H.C.	IPT
A24BB4P	230V, 50Hz, Single phase	17	15	5.18	1.74	6.21	1.99	7.46	2.37
			20	4.90	1.84	5.86	2.12	7.10	2.49
			25	4.62	1.94	5.54	2.24	6.75	2.61
A28BB4P	230V, 50Hz, Single phase	18	15	5.84	1.92	7.00	2.19	8.40	2.60
			20	5.52	2.03	6.60	2.33	8.00	2.74
			25	5.20	2.14	6.24	2.47	7.60	2.88
A34BB4P	230V, 50Hz, Single phase	27	15	8.18	2.49	9.80	2.84	11.8	3.37
			20	7.73	2.63	9.24	3.02	11.2	3.55
			25	7.28	2.77	8.74	3.20	10.6	3.73
A34BB4P	400V, 50Hz, Three phase	27	15	8.18	2.38	9.80	2.72	11.8	3.23
			20	7.73	2.52	9.24	2.89	11.2	3.40
			25	7.28	2.65	8.74	3.06	10.6	3.57
A43BB4P	400V, 50Hz, Three phase	30	15	10.2	2.87	12.3	3.28	14.7	3.90
			20	9.66	3.03	11.6	3.49	14.0	4.10
			25	9.10	3.20	10.9	3.69	13.3	4.31
A50BB4P	400V, 50Hz, Three phase	31	15	11.3	3.48	13.6	3.98	16.3	4.72
			20	10.70	3.68	12.8	4.22	15.5	4.97
			25	10.08	3.88	12.1	4.47	14.7	5.22

Legend:
H.C. = Heating Capacity
IPT = Power Consumption

Model	Heating capacities are based on conditions below.	Model	Heating capacities are ba conditions below.
CS-A24BB4P	1 phase, 50Hz, 230V	CS-A28BB4P	1 phase, 50Hz, 230V
Heating capacity	Indoor temp. 20°C D.B.	Heating capacity	Indoor temp. 20°C D.B.
7.1kW	Outdoor temp. 7°C D.B. 6°C W.B.	8.0kW	Outdoor temp. 7°C D.B. 6°C
	Standard air volume 17 m3/min		Standard air volume 18 m3/

Model	Heating capacities are based on conditions below.	Model	Heating capacities are ba conditions below.
CS-A34BB4P	1 phase, 50Hz, 230V	CS-A34BB4P	3 phase, 50Hz, 400V
Heating capacity	Indoor temp. 20°C D.B.	Heating capacity	Indoor temp. 20°C D.B.
11.2kW	Outdoor temp. 7°C D.B. 6°C W.B.	11.2kW	Outdoor temp. 7°C D.B. 6°C
	Standard air volume 27 m3/min		Standard air volume 27 m3/

Model	Heating capacities are based on conditions below.	Model	Heating capacities are ba conditions below.
CS-A43BB4P	3 phase, 50Hz, 400V	CS-A50BB4P	3 phase, 50Hz, 400V
Heating capacity	Indoor temp. 20°C D.B.	Heating capacity	Indoor temp. 20°C D.B.
14.0kW	Outdoor temp. 7°C D.B. 6°C W.B.	15.5kW	Outdoor temp. 7°C D.B. 6°C
	Standard air volume 30 m3/min		Standard air volume 31 m3/

34. COOLING CAPACITY PERFORMANCE DATA

Model (CS-)	Power Source	Entering AIR Temperature		Temperature Air Entering Condeser (°C D.B.)												
				25 °C			30 °C			35 °C			40 °C			4
				TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC	SHC	IPT	TC
		D.B.	W.B.	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
A24BB4P	230V, 50Hz, Single phase	23	17	6.30	4.13	1.95	5.99	4.04	2.13	5.67	3.94	2.30	5.29	3.81	2.58	5.04
			19	6.65	3.39	2.05	6.34	3.36	2.21	6.01	3.31	2.42	5.66	3.23	2.68	5.39
			22	7.12	2.56	2.11	6.72	2.56	2.28	6.43	2.57	2.49	6.06	2.54	2.76	5.77
		25	17	6.35	4.86	1.97	6.04	4.74	2.14	5.74	4.62	2.32	5.35	4.46	2.56	5.08
			19	6.80	4.28	2.09	6.48	4.21	2.25	6.16	4.12	2.46	5.76	4.00	2.70	5.47
			22	7.34	3.34	2.14	6.93	3.29	2.30	6.59	3.26	2.51	6.22	3.20	2.76	5.91
		27	17	6.40	5.70	2.00	6.10	5.55	2.15	5.81	5.40	2.34	5.40	5.19	2.54	5.11
			19	6.94	5.14	2.13	6.62	5.03	2.30	6.30	4.91	2.50	5.86	4.75	2.72	5.54
			22	7.55	4.15	2.16	7.14	4.07	2.33	6.74	3.98	2.54	6.39	3.90	2.76	6.04
		29	17	6.48	6.35	2.09	6.17	6.11	2.24	5.88	5.88	2.42	5.47	5.47	2.64	5.17
			19	7.03	5.98	2.21	6.69	5.82	2.38	6.38	5.67	2.56	5.93	5.43	2.80	5.61
			22	7.60	4.97	2.28	7.20	4.86	2.47	6.80	4.72	2.66	6.45	4.64	2.85	6.10
		32	17	6.54	6.41	2.15	6.21	6.21	2.31	5.92	5.92	2.47	5.52	5.52	2.71	5.22
			19	7.09	7.02	2.26	6.74	6.74	2.43	6.43	6.43	2.60	5.98	5.98	2.85	5.66
			22	7.62	6.25	2.36	7.25	6.09	2.56	6.84	5.88	2.74	6.49	5.78	2.91	6.14
A28BB4P	230V, 50Hz, Single phase	23	17	7.28	4.77	2.10	6.96	4.70	2.29	6.53	4.54	2.47	6.11	4.40	2.66	5.68
			19	7.69	3.92	2.16	7.31	3.87	2.36	6.92	3.81	2.55	6.47	3.69	2.69	6.02
			22	8.30	2.99	2.20	7.89	3.00	2.40	7.48	2.99	2.60	7.05	2.96	2.74	6.62
		25	17	7.32	5.60	2.12	7.00	5.49	2.32	6.60	5.32	2.50	6.16	5.14	2.69	5.74
			19	7.75	4.89	2.23	7.42	4.82	2.41	7.01	4.70	2.62	6.54	4.54	2.77	6.10
			22	8.41	3.82	2.27	8.01	3.80	2.46	7.59	3.76	2.67	7.14	3.68	2.81	6.73
		27	17	7.35	6.55	2.15	7.04	6.40	2.35	6.67	6.21	2.52	6.21	5.96	2.71	5.81
			19	7.82	5.79	2.29	7.53	5.72	2.47	7.10	5.54	2.69	6.60	5.35	2.85	6.18
			22	8.51	4.68	2.34	8.13	4.63	2.52	7.70	4.55	2.74	7.23	4.41	2.88	6.84
		29	17	7.45	7.30	2.22	7.13	7.06	2.41	6.77	6.77	2.57	6.29	6.29	2.73	5.82
			19	7.98	6.78	2.37	7.66	6.66	2.56	7.20	6.41	2.75	6.69	6.12	2.88	6.27
			22	8.56	5.61	2.49	8.19	5.53	2.66	7.72	5.37	2.84	7.28	5.24	2.96	6.89
		32	17	7.51	7.36	2.27	7.20	7.20	2.44	6.84	6.84	2.61	6.34	6.34	2.75	5.83
			19	8.08	7.99	2.43	7.74	7.74	2.61	7.27	7.27	2.79	6.74	6.74	2.89	6.33
			22	8.59	7.04	2.58	8.24	6.92	2.75	7.74	6.66	2.91	7.31	6.51	3.01	6.92

A34BB4P	230V, 50Hz, Single phase	23	17	10.2	6.68	2.81	9.6	6.48	3.10	9.10	6.32	3.31	8.50	6.12	3.56	8.00
			19	10.8	5.51	2.92	10.2	5.38	3.20	9.6	5.31	3.41	9.10	5.18	3.67	8.56
			22	11.7	4.20	3.01	11.1	4.23	3.29	10.5	4.21	3.48	9.9	4.16	3.74	9.24
		25	17	10.2	7.79	2.86	9.7	7.60	3.12	9.16	7.37	3.34	8.53	7.12	3.58	8.14
			19	10.9	6.88	3.00	10.4	6.75	3.25	9.8	6.58	3.51	9.20	6.39	3.73	8.68
			22	11.8	5.36	3.09	11.2	5.34	3.33	10.6	5.25	3.58	9.98	5.14	3.78	9.42
		27	17	10.2	9.04	2.92	9.8	8.89	3.14	9.22	8.57	3.37	8.56	8.21	3.59	8.27
			19	11.0	8.15	3.07	10.6	8.06	3.31	10.0	7.80	3.60	9.30	7.53	3.78	8.80
			22	11.9	6.55	3.16	11.3	6.46	3.37	10.7	6.31	3.67	10.04	6.13	3.82	9.59
		29	17	10.4	10.15	3.00	9.9	9.78	3.21	9.35	9.35	3.45	8.73	8.73	3.66	8.27
			19	11.2	9.50	3.18	10.7	9.27	3.40	10.09	8.98	3.66	9.48	8.68	3.86	8.91
			22	12.0	7.83	3.34	11.4	7.72	3.56	10.8	7.48	3.80	10.15	7.31	3.97	9.68
		32	17	10.5	10.28	3.05	9.9	9.95	3.25	9.44	9.44	3.51	8.84	8.84	3.71	8.26
			19	11.3	11.17	3.25	10.7	10.70	3.46	10.15	10.15	3.69	9.61	9.61	3.91	8.98
			22	12.0	9.84	3.46	11.5	9.66	3.68	10.8	9.29	3.89	10.2	9.10	4.07	9.74
A34BB4P	400V, 50Hz, Three phase	23	17	10.2	6.68	2.63	9.6	6.48	2.84	9.10	6.32	3.10	8.50	6.12	3.40	8.00
			19	10.8	5.51	2.78	10.2	5.38	3.02	9.6	5.31	3.28	9.10	5.18	3.50	8.56
			22	11.7	4.20	3.01	11.1	4.23	3.26	10.5	4.21	3.35	9.9	4.16	3.57	9.24
		25	17	10.2	7.79	2.63	9.7	7.60	2.84	9.16	7.37	3.09	8.53	7.12	3.38	8.14
			19	10.9	6.88	2.80	10.4	6.75	3.02	9.8	6.58	3.29	9.20	6.39	3.54	8.68
			22	11.8	5.36	2.94	11.2	5.34	3.17	10.6	5.25	3.36	9.98	5.14	3.61	9.42
		27	17	10.2	9.04	2.63	9.8	8.89	2.84	9.22	8.57	3.09	8.56	8.21	3.36	8.27
			19	11.0	8.15	2.81	10.6	8.06	3.03	10.0	7.80	3.30	9.30	7.53	3.59	8.80
			22	11.9	6.55	2.87	11.3	6.46	3.09	10.7	6.31	3.37	10.04	6.13	3.66	9.59
		29	17	10.4	10.15	2.62	9.9	9.78	2.83	9.35	9.35	3.05	8.73	8.73	3.28	8.27
			19	11.2	9.50	2.80	10.7	9.27	3.03	10.09	8.98	3.26	9.48	8.68	3.50	8.91
			22	12.0	7.83	3.01	11.4	7.72	3.26	10.8	7.48	3.51	10.15	7.31	3.77	9.68
		32	17	10.5	10.28	2.61	9.9	9.95	2.83	9.44	9.44	3.03	8.84	8.84	3.22	8.26
			19	11.3	11.2	2.79	10.7	10.7	3.02	10.15	10.15	3.23	9.61	9.61	3.44	8.98
			22	12.0	9.84	3.11	11.5	9.66	3.37	10.8	9.29	3.61	10.2	9.10	3.84	9.74

A43BB4P	400V, 50Hz, Three phase	23	17	12.6	8.27	3.32	12.0	8.10	3.57	11.4	7.91	3.95	10.8	7.74	4.29	10.0
			19	13.3	6.80	3.48	12.7	6.74	3.75	12.1	6.63	4.11	11.5	6.56	4.42	10.8
			22	14.6	5.24	3.65	14.0	5.30	3.94	13.3	5.32	4.23	12.7	5.35	4.60	12.0
		25	17	12.7	9.69	3.35	12.0	9.45	3.64	11.5	9.22	4.00	10.8	9.05	4.34	10.1
			19	13.6	8.54	3.55	12.9	8.40	3.83	12.3	8.23	4.18	11.6	8.08	4.52	10.9
			22	14.8	6.72	3.79	14.1	6.72	4.06	13.5	6.69	4.39	12.9	6.67	4.70	12.1
		27	17	12.7	11.3	3.39	12.1	11.0	3.71	11.5	10.7	4.04	10.9	10.5	4.39	10.2
			19	13.8	10.2	3.63	13.1	10.0	3.91	12.5	9.75	4.25	11.8	9.52	4.62	11.0
			22	15.0	8.24	3.92	14.3	8.18	4.18	13.7	8.10	4.55	13.2	8.03	4.80	12.2
		29	17	13.0	12.8	3.52	12.4	12.2	3.84	11.8	11.8	4.13	11.1	11.1	4.43	10.4
			19	13.9	11.8	3.73	13.3	11.5	4.04	12.6	11.2	4.35	12.0	10.9	4.66	11.2
			22	14.9	9.78	3.97	14.4	9.70	4.28	13.6	9.45	4.61	13.1	9.41	4.85	12.2
		32	17	13.2	13.0	3.61	12.6	12.6	3.92	11.9	11.9	4.20	11.2	11.2	4.46	10.5
			19	14.0	13.9	3.80	13.4	13.4	4.13	12.7	12.7	4.42	12.1	12.1	4.69	11.3
			22	14.9	12.2	4.00	14.4	12.1	4.34	13.5	11.6	4.65	13.0	11.6	4.89	12.2
A50BB4P	400V, 50Hz, Three phase	23	17	14.3	9.35	3.84	13.4	9.07	4.24	12.6	8.76	4.64	11.8	8.47	5.04	11.2
			19	14.9	7.57	4.07	14.2	7.55	4.50	13.5	7.44	4.92	12.7	7.26	5.29	12.1
			22	15.7	5.67	4.40	15.1	5.74	4.86	14.6	5.85	5.26	13.8	5.78	5.56	12.9
		25	17	14.4	11.01	3.91	13.5	10.59	4.29	12.7	10.20	4.69	11.9	9.92	5.10	11.3
			19	15.1	9.49	4.16	14.4	9.36	4.57	13.8	9.22	4.95	12.9	8.95	5.36	12.2
			22	16.0	7.30	4.50	15.3	7.29	4.93	14.8	7.32	5.33	14.0	7.23	5.68	13.2
		27	17	14.5	12.9	3.98	13.5	12.3	4.34	12.7	11.8	4.74	12.0	11.5	5.15	11.4
			19	15.3	11.3	4.26	14.6	11.1	4.64	14.0	10.92	4.99	13.0	10.55	5.42	12.3
			22	16.3	8.98	4.60	15.6	8.88	5.01	15.0	8.84	5.39	14.3	8.74	5.80	13.4
		29	17	14.7	14.4	4.08	13.6	13.5	4.47	12.9	12.9	4.85	12.1	12.1	5.25	11.5
			19	15.3	13.0	4.33	14.7	12.7	4.73	14.0	12.5	5.11	13.1	12.0	5.53	12.5
			22	16.5	10.83	4.66	15.8	10.67	5.06	15.1	10.47	5.43	14.3	10.31	5.85	13.6
		32	17	14.8	14.5	4.15	13.7	13.7	4.55	13.0	13.0	4.93	12.2	12.2	5.31	11.6
			19	15.4	15.2	4.37	14.7	14.7	4.79	14.1	14.1	5.19	13.2	13.2	5.59	12.6
			22	16.7	13.7	4.70	16.0	13.4	5.10	15.1	13.0	5.46	14.3	12.7	5.89	13.6

Legend:
TC = Total Cooling Capacity
SHC = Sensible Heat Capacity
IPT = Power Consumption

Model	Cooling capacities are based on conditions below.	Model	Cooling capacities are ba conditions below.
CS-A24BB4P	1 phase, 50Hz, 230V	CS-A28BB4P	1 phase, 50Hz, 230V
Cooling capacity	Indoor temp. 27°C D.B. 19°C W.B.	Cooling capacity	Indoor temp. 27°C D.B. 19°C
6.3kW	Outdoor temp. 35°C D.B.	7.1kW	Outdoor temp. 35°C D.B.
	Standard air volume 17 m3/min		Standard air volume 18 m3/

Model	Cooling capacities are based on conditions.	Model	Cooling capacities are ba conditions below.
CS-A34BB4P	1 phase, 50Hz, 230V	CS-A34BB4P	3 phase, 50Hz, 400V
Cooling capacity	Indoor temp. 27°C D.B. 19°C W.B.	Cooling capacity	Indoor temp. 27°C D.B. 19°C
10.0kW	Outdoor temp. 35°C D.B.	10.0kW	Outdoor temp. 35°C D.B.
	Standard air volume 27 m3/min		Standard air volume 27 m3/

Model	Cooling capacities are based on conditions.	Model	Cooling capacities are ba conditions below.
CS-A43BB4P	3 phase, 50Hz, 400V	CS-A50BB4P	3 phase, 50Hz, 400V
Cooling capacity	Indoor temp. 27°C D.B. 19°C W.B.	Cooling capacity	Indoor temp. 27°C D.B. 19°C
12.5kW	Outdoor temp. 35°C D.B.	14.0kW	Outdoor temp. 35°C D.B.
	Standard air volume 30 m3/min		Standard air volume 31 m3/